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The implementation
of Advanced Practice Nursing in Catalonia

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UNIVERSITY OF BARCELONA

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Doctorate Programme in Medicine and Translational Research

THE IMPLEMENTATION OF ADVANCED PRACTICE NURSING IN CATALONIA

DISSERTATION TO OBTAIN THE DEGREE OF DOCTOR PRESENTED BY

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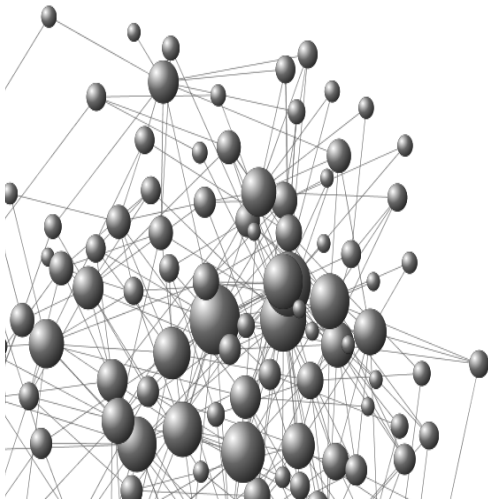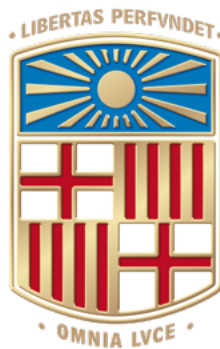Dr. Adelaida Zabalegui Yárnoz

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DOCTORAL THESIS

Sonia Sevilla Guerra

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Dr. Adelaida Zabalegui Yárnoz

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This is one for the good days.

Thom Yorke

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ABBREVIATIONS

ACNP	Acute Care Nurse Practitioner
AIIC	Association des infirmières et infirmiers du Canada
APN	Advanced Practice Nursing
APNs	Advanced Practice Nurses
APRD	Advanced Practice Role Delineation
CICI	Context and Implementation of Complex Interventions
CFIR	Consolidated Framework for Implementation Research
CNC	Clinical Nurse Consultant
CNS	Clinical Nurse Specialist
GENCAT	Generalitat de Catalunya. Government of Catalonia
IDREPA	Instrumento Delineación de rol de la Enfermera de Práctica Avanzada
ICN	International Council of Nurses
IOM	The Institute of Medicine
IDESCAT	Statistical Institute of Catalonia
NA	Network Analysis
NP	Nurse Practitioner
OECD	Organization for Economic Co-operation and Development
PERIS	Research and innovation for the Health Research and Innovation Strategic Plan
RN	Registered Nurse
SoP	Scope of Practice
USA	United States of America
RGN	Registered General Nurse
WHO	World Health Organization

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Introduction: The expansion of professional roles has been proved to be an innovative solution across some countries in order to help address healthcare integration, coordination, continuity, access and health care sustainability. The development and implementation of different roles in advanced practice nursing has been considered one of those innovations in pioneering healthcare reforms. The need for nurses to adapt their practice in all settings has been a necessary step to meet the demands of our changing health care system and to contribute to address objectives and sustainable development goals set by different human resources strategies. However, entwine with the development and implementation process of new nursing roles are its environment and context. In Catalonia, some nurses have evolved and adapted to international standards without the legal acknowledgment of advanced practice that other countries have. The evolution of these high-standard nurses shares the confusion with the international nursing profession about the terminology, specific function and scope of practice of other advanced practice nursing roles. Understanding changes made in nursing practice and how context affects implementation of these changes can be crucial to manage difficulties that arise during this process. Similarly, grasping how implementation of advance nursing roles affects practice, organization and national contexts can be essential to better predict and measure the impact of these innovations in healthcare.

Objectives: In order to gain an enhanced evaluation of the implementation of advanced practice nursing in Catalonia this study presents a workforce role delineation in Catalonia and a comprehensive insight into the dynamics of context in Catalonia, Spain and Quebec, Canada.

Methodology: The research had two stages. In Stage 1, the study intended to collect data on the practice of those working in advanced practice roles. A translation, cross-cultural adaptation and psychometric analysis of the Spanish version of the Modified Advanced Practice Role Delineation (APRD) tool was performed followed by a role delineation study of advanced practice nursing. A cross-sectional survey of practice domains and trends in role functions was implemented through a cross-sectional, descriptive, exploratory study. The study population were Spanish specialist nurses and expert nurses that have been previously identified by the authors as nurses with a more advanced competency profile than a general nurse in Spain. The study had

a convenience sample of 151 nurses employed by a dual tertiary and community hospital in Barcelona, Spain. The data was collected over six months in 2015 -2016. The tool comprised 41 items across five domains of advanced practice nursing (direct comprehensive care, support of systems, research, education and publication and professional leadership). Variables used in this stage of the study were length of nursing experience, educational qualifications, context of practice, level in professional career ladder and role implication on other disciplines, services and patients. In the second stage of the study, to better understand the context of advanced practice implementation a visual network analysis of relations connecting contextual factors in advanced Practice Nursing development in Catalonia. The study design was qualitative, descriptive and explanatory. Participants from the diverse perspectives of practice, organization and environment levels were engaged to participate in semi-structured focus groups in March 2016. They were asked to inform on different dimensions of the context of role development: understanding of the role, felt needs, perceived outcomes, barriers and facilitators. Further data was gathered through interviews in Quebec, Canada to inform about of the context dimensions at external, organization and team level. The study was approved by the Clinical Research Ethics Committee (CEIC) at Hospital Clínic, Barcelona (Reg. HCB/2014/0811 and HCB/2016/0055). Participants provided written informed consent prior to participation in the study. Participants were guaranteed anonymity in the findings report and research analysis.

Results: The results provided support for the instrument´s validity and reliability in advanced practice nursing in a tertiary and community hospital. The tool showed internal consistency, with a Cronbach's alpha coefficient of 0.86 and stability over time. The cross-sectional study was designed to explore the extent and patterns of advanced nursing practice activity within the domains of expert care planning, integrated care, inter-professional collaboration, education, research, evidence-based practice and professional leadership. Advanced practice domains were more strongly influenced by the predictors of nursing position and professional career ladder while age and experience were found to be weak predictors of advanced practice domains. The conceptualization of the advanced nursing practice profile provides data which allow description of activities and domains in the context of practice along with description of healthcare adaptation and change management. On the context analysis, 30 interviews were conducted in Quebec while 44 participants were interviewed in Catalonia. Integration of findings reflected a vast

predominance of convergent themes despite differences in context and population characteristics. The study identified common and diverge context factors of advanced practice development and implementation across both countries. Barriers and facilitators were prominent almost evenly across all groups, however, it remained difficult to understand the interrelated dynamics between implementation and context.

Conclusions: This study represents the first attempt to examine the reliability and the validity of a Spanish tool capable to delineate advanced practice nursing domains and activities. It is the first attempt to describe the profile of advanced nursing practice in Spain by exploring the extent and patterns of advanced practice activity in newly developing roles. The study achieved conceptual, semantic and content equivalence of the Spanish instrument which allows to define the extent of advanced practice activities and domains using a validated, adapted instrument. The second stage of the study provided a visual network of relations connecting contextual factors in Advanced Practice Nursing development in Catalonia. Also, it identified common and diverge context factors of advanced practice development and implementation across two countries. Barriers and facilitators were prominent almost evenly across all groups, however the organisation and environment level themes were the most coded and discussed during the interviews.

Implications for Practice: Innovative advanced practice nursing roles are of greater relevance in terms of transforming the model of care such as orientation towards long-term conditions, greater resolution, accessibility, quality in high specialization and interdisciplinary public health. Greater clarity around these roles may assist in optimizing workforce utilization, meeting new service delivery requirements and enabling greater internal organizational cohesion, consistency and professional clarity.

RESUMEN

Introducción: La expansión de los roles profesionales ha demostrado ser una solución innovadora en algunos países para ayudar a abordar la integración, la coordinación, la continuidad, el acceso y la sostenibilidad del sistema sanitario. El desarrollo y la implementación de diferentes roles en la práctica avanzada de enfermería se ha considerado una de esas innovaciones en reformas de sistemas

sanitarios pioneros. La necesidad de que las enfermeras adapten su práctica en todos los entornos ha sido un paso necesario para satisfacer las demandas de nuestro dinámico sistema sanitario y para contribuir a abordar los objetivos de desarrollo sostenible establecidos por diferentes estrategias internacionales de recursos humanos. Sin embargo, entrelazado con el proceso de desarrollo e implementación de los nuevos roles de enfermería está su entorno y contexto. En Cataluña, algunas enfermeras han evolucionado y se han adaptado a las normas internacionales sin el reconocimiento legal que la práctica avanzada tiene otros países. La evolución de estas enfermeras comparte la confusión con la profesión de enfermería internacional sobre la terminología, la función específica y el alcance de la práctica de éstos roles de enfermería en la práctica avanzada. Comprender los cambios realizados en la práctica de enfermería y cómo el contexto afecta la implementación de estos cambios puede ser crucial para gestionar las dificultades que surgen durante este proceso. Del mismo modo, entender cómo la implementación de los roles avanzados de enfermería afecta la práctica, la organización y los contextos nacionales puede ser esencial para predecir y medir el impacto de estas innovaciones en el cuidado de la salud.

Objetivos: Con el fin de obtener una mejor evaluación de la implementación de la práctica avanzada de enfermería en Cataluña, este estudio presenta una definición del rol en Cataluña y una visión dinámica e integral del contexto en Cataluña, España y Quebec, Canadá.

Metodología: La investigación se realizó en dos etapas. En la primera etapa, el estudio pretende recoger datos sobre aquellos que trabajan en roles de práctica avanzada. Se realizó una traducción, adaptación intercultural y un análisis psicométrico de la versión en español de la herramienta "Modified Advanced Practice Role Delineation (APRD)" seguido de un estudio de delineación de funciones de la enfermería de práctica avanzada. Mediante un estudio exploratorio, descriptivo y transversal se implementó una encuesta de tendencias en funciones y dominios de práctica. La población del estudio fueron enfermeras especialistas españolas y enfermeras expertas que los autores identificaron anteriormente como enfermeras con un perfil de competencia más avanzado que una enfermera general en España. El estudio contó con una muestra de conveniencia de 151 enfermeras empleadas por un hospital dual terciario y comunitario en Barcelona, España. Los datos se recopilaron durante seis meses en 2015-2016. La herramienta consta de 41 ítems en cinco dominios de enfermería de práctica avanzada (atención integral directa,

apoyo de sistemas, investigación, educación y publicación y liderazgo profesional). Las variables utilizadas en esta etapa del estudio fueron la experiencia en enfermería, la educación, la posición laboral, el nivel de carrera profesional y la implicación del rol en otras disciplinas, servicios y pacientes. En la segunda etapa del estudio, para comprender mejor el contexto de la implementación de la práctica avanzada, se realizó un análisis de redes entre las relaciones que conectan la práctica avanzada y los factores contextuales que influyen en el desarrollo de la enfermería en Cataluña. El diseño del estudio fue cualitativo, descriptivo y explicativo. Los participantes pertenecían a diversas perspectivas a nivel de práctica, organización y entorno externo y se comprometieron a participar en grupos focales semiestructurados en marzo de 2016. Se les pidió que informaran sobre diferentes dimensiones de la implementación y desarrollo de la práctica avanzada y de su entorno: comprensión del rol, necesidades percibidas, percepción de resultados, barreras y facilitadores. Además, se recogieron más datos a través de entrevistas en Quebec, Canadá, para informar sobre las mismas dimensiones de contexto a nivel externo, organizacional y de equipo. El estudio fue aprobado por el Comité de Ética en Investigación Clínica (CEIC) del Hospital Clínico de Barcelona (Reg. HCB / 2014/0811 y HCB / 2016/0055). Los participantes proporcionaron un consentimiento informado por escrito antes de participar en el estudio. A los participantes se les garantizó el anonimato en el informe de hallazgos y análisis de investigación.

Resultados: Los resultados respaldaron la validez y fiabilidad del instrumento de delineación de la práctica avanzada de enfermería en un hospital terciario y comunitario. La herramienta mostró consistencia interna, con un coeficiente alfa de Cronbach de 0,86 y estabilidad a lo largo del tiempo. El estudio transversal fue diseñado para explorar el alcance y los patrones de la actividad de la práctica avanzada de enfermería dentro de los dominios de planificación del cuidado experto, atención integrada, colaboración interprofesional, educación, investigación, práctica basada en la evidencia y liderazgo profesional. Los dominios de práctica avanzada estuvieron fuertemente influenciados por los predictores del puesto de trabajo y nivel de carrera profesional, mientras que la edad y la experiencia fueron predictores débiles de los dominios de práctica avanzada. La conceptualización del perfil de la práctica avanzada de enfermería proporciona información que permite la descripción de actividades y dominios en el contexto de práctica, junto con la descripción de adaptación al sistema sanitario y la gestión del cambio. En el análisis de contexto, 30 entrevistas se realizaron en Quebec, mientras que 44 participantes fueron

entrevistados en Cataluña. La integración de los hallazgos refleja un gran predominio de temas convergentes a pesar de las diferencias en el contexto y las características de la población. El estudio identificó factores de contexto comunes y divergentes sobre el desarrollo e implementación de prácticas avanzadas en ambos países. Las barreras y los facilitadores fueron prominentes casi de manera uniforme en todos los grupos, sin embargo, siguió siendo difícil comprender la dinámica interrelacionada entre la implementación y el contexto.

Conclusiones: Este estudio representa el primer intento de examinar la fiabilidad y la validez de una herramienta española capaz de delinear dominios y actividades de enfermería de práctica avanzada. El estudio logró la equivalencia conceptual, semántica y de contenido del instrumento español, lo que permite definir el alcance de las actividades de práctica avanzada y los dominios utilizando un instrumento validado y fiable. Se describe el perfil de práctica de avanzada de enfermería en España mediante la exploración del alcance y los patrones de actividad de la práctica avanzada en los roles recientemente desarrollados. La segunda etapa del estudio proporcionó una red visual de relaciones que conecta factores contextuales en el desarrollo de la práctica avanzada de enfermería en Cataluña. Además, identificó factores de contexto comunes y divergentes del desarrollo y la implementación de prácticas avanzadas en dos países. Las barreras y facilitadores fueron prominentes casi uniformemente en todos los grupos, sin embargo, los temas de organización y entorno externo fueron los más codificados y discutidos durante las entrevistas.

Implicaciones para la Practica: Los roles innovadores de enfermería de práctica avanzada son de mayor relevancia en términos de transformación del modelo de atención, como la orientación hacia condiciones a largo plazo, mayor resolución, accesibilidad, calidad en alta especialización y salud pública interdisciplinaria. Una mayor claridad en torno a estos roles puede ayudar a optimizar la utilización de la fuerza de trabajo, cumplir los nuevos requisitos de prestación de servicios y permitir una mayor cohesión organizacional interna, consistencia y claridad profesional.

RESUM

Introducció: L'expansió dels rols professionals ha demostrat ser una solució innovadora en alguns països per ajudar a abordar la integració, la coordinació, la continuïtat, l'accés i la sostenibilitat del sistema sanitari. El desenvolupament i la

implementació de diferents rols en la pràctica avançada d'infermeria s'ha considerat una d'aquestes innovacions en reformes de sistemes sanitaris pioners. La necessitat que les infermeres adaptin la seva pràctica en tots els entorns ha estat un pas necessari per a satisfer les demandes del nostre dinàmic sistema sanitari i per contribuir a abordar els objectius de desenvolupament sostenible establerts per diferents estratègies internacionals de recursos humans. No obstant això, entrellaçat amb el procés de desenvolupament i implementació dels nous rols d'infermeria és el seu entorn i context. A Catalunya, algunes infermeres han evolucionat i s'han adaptat a les normes internacionals sense el reconeixement legal de la pràctica avançada que tenen altres països. L'evolució d'aquestes infermeres amb alt nivell comparteix la confusió amb la professió d'infermeria internacional sobre la terminologia, la funció específica i l'abast de la pràctica d'altres rols d'infermeria de pràctica avançada. Comprendre els canvis realitzats en la pràctica d'infermeria i com el context afecta la implementació d'aquests canvis pot ser crucial per a gestionar les dificultats que sorgeixen durant aquest procés. De la mateixa manera, entendre com la implementació dels rols avançats d'infermeria afecta la pràctica, l'organització i els contextos nacionals pot ser essencial per predir i mesurar l'impacte d'aquestes innovacions en la cura de la salut.

Objectius: Per tal d'obtenir una millor avaluació de la implementació de la pràctica avançada d'infermeria a Catalunya, aquest estudi presenta una definició del rol a Catalunya i una visió integral de la dinàmica de l'entorn a Catalunya, Espanya i el Quebec, Canadà.

Metodologia: La investigació es va realitzar en dues etapes. A la primera etapa, l'estudi pretenia recollir dades sobre aquells que treballen en rols de pràctica avançada. Es va realitzar una traducció, adaptació intercultural i una anàlisi psicomètric de la versió en espanyol de l'eina "Modified Advanced Practice Role Delineation (APRD)" seguit d'un estudi de delineació de funcions de la infermeria de pràctica avançada. Mitjançant un estudi exploratori, descriptiu i transversal es va implementar una enquesta de tendències en funcions i dominis de pràctica. La població de l'estudi van ser infermeres especialistes espanyoles i infermeres expertes que els autors van identificar anteriorment com infermeres amb un perfil de competència més avançada que una infermera general a Espanya. L'estudi va comptar amb una mostra de conveniència de 151 infermeres emprades per un hospital dual terciari i comunitari a Barcelona, Espanya. Les dades es van recopilar durant sis mesos en 2015-2016. L'eina consta de 41 ítems en cinc dominis

d'infermeria de pràctica avançada (atenció integral directa, suport de sistemes, investigació, educació i publicació i lideratge professional). Les variables utilitzades en aquesta etapa de l'estudi van ser l'experiència en infermeria, l'educació, la posició laboral, el nivell de carrera professional i la implicació del paper en altres disciplines, serveis i pacients. En la segona etapa de l'estudi, per comprendre millor el context de la implementació de la pràctica avançada, es va realitzar una anàlisi de xarxes entre les relacions que connecten la pràctica avançada i els factors contextuals que influeixen en el desenvolupament de la infermeria a Catalunya. El disseny de l'estudi va ser qualitatiu, descriptiu i explicatiu. Els participants pertanyien a diverses perspectives a nivell de pràctica, organització i entorn extern i es van comprometre a participar en grups focals semiestructurats al març de 2016. Se'ls va demanar que informessin sobre diferents dimensions de la implementació i desenvolupament de la pràctica avançada i del seu entorn : comprensió del paper, necessitats percebudes, percepció de resultats, barreres i facilitadors. A més, es van recollir més dades a través d'entrevistes a Quebec, Canadà, per informar sobre les dimensions del context a nivell extern, organitzacional i d'equip. L'estudi va ser aprovat pel Comitè d'Ètica en Investigació Clínica (CEIC) de l'Hospital Clínic de Barcelona (Reg. HCB / 2014/0811 i HCB / 2016/0055). Els participants van proporcionar un consentiment informat per escrit abans de participar en l'estudi. Als participants se'ls va garantir l'anonimat en l'informe de troballes i anàlisis de recerca.

Resultats: Els resultats van donar suport la validesa i fiabilitat de l'instrument de delineació de la pràctica avançada d'infermeria en un hospital terciari i comunitari. L'eina va mostrar consistència interna, amb un coeficient alfa de Cronbach de 0,86 i estabilitat al llarg del temps. L'estudi transversal va ser dissenyat per explorar l'abast i els patrons de l'activitat de la pràctica avançada d'infermeria dins dels dominis de planificació de la cura expert, atenció integrada, col·laboració interprofessional, educació, investigació, pràctica basada en l'evidència i lideratge professional. Els dominis de pràctica avançada van estar fortament influenciats pels predictors del lloc de treball i nivell de carrera professional, mentre que l'edat i l'experiència van ser predictors febles dels dominis de pràctica avançada. La conceptualització del perfil de la pràctica avançada d'infermeria proporciona informació que permet la descripció d'activitats i dominis en el context de pràctica, juntament amb la descripció d'adaptació al sistema sanitari i la gestió del canvi. En l'anàlisi de context, 30 entrevistes es van realitzar al Quebec, mentre que 44 participants van ser entrevistats a Catalunya. La integració de les troballes reflecteix un vast predomini

de temes convergents tot i les diferències en el context i les característiques de la població. L'estudi va identificar factors de context comuns i divergents del desenvolupament i implementació de pràctiques avançades en tots dos països. Les barreres i els facilitadors van ser prominents gairebé de manera uniforme en tots els grups, però, va seguir sent difícil comprendre la dinàmica interrelacionada entre la implementació i el context.

Conclusions: Aquest estudi representa el primer intent d'examinar la fiabilitat i la validesa d'una eina espanyola capaç de delinear dominis i activitats d'infermeria de pràctica avançada. És el primer intent de descriure el perfil de pràctica d'avançada d'infermeria a Espanya mitjançant l'exploració de l'abast i els patrons d'activitat de pràctica avançada en els rols recentment desenvolupats. L'estudi va aconseguir l'equivalència conceptual, semàntica i de contingut de l'instrument espanyol, el que permet definir l'abast de les activitats de pràctica avançada i els dominis utilitzant un instrument validat i fiable. La segona etapa de l'estudi va proporcionar una xarxa visual de relacions que connecta factors contextuals en el desenvolupament de la pràctica avançada d'infermeria a Catalunya. A més, va identificar factors de context comuns i divergents del desenvolupament i la implementació de pràctiques avançades en dos països. Les barreres i facilitadors van ser prominents gairebé uniformement en tots els grups, però, els temes d'organització i entorn extern van ser els més codificats i discutits durant les entrevistes.

Implicacions per a la Practica: Els rols innovadors d'infermeria de pràctica avançada són de major rellevància en termes de transformació del model d'atenció, com l'orientació cap a condicions a llarg termini, més resolució, accessibilitat, qualitat en alta especialització i salut pública interdisciplinària. Una major claredat al voltant d'aquests rols pot ajudar a optimitzar la utilització de la força de treball, complir els nous requisits de prestació de serveis i permetre una major cohesió organitzacional interna, consistència i claredat professional.

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PREFACE

The way nursing has professionalised and evolved over the years has being the result of the changing demands on care from the population. Having the experience of working as a Clinical Nurse Specialist in Multiple Sclerosis has gave me the opportunity to see how nursing, the more extensive and comprehensive health workforce, has changed significantly to meet the challenges facing the health system. Following ten years of work and training in England, I found a self-motivated predisposition to find the health system equilibrium between the nursing care supply and the current services administered internationally. Being part of the European Academy of Nursing (EANS) gave me the opportunity to participate in a three-year programme of annual summer school where I have learnt advanced research methods while I was a PhD candidate. It also had the unique opportunity to be inspired and challenged by complex interventions research methods though the journey.

This thesis is the result of this professional drive and the vision of an exceptional team and thesis director to evaluate the existing nursing workforce and to implement advanced nursing practices locally. With this study, we are welcoming the changes and the dynamics of the nursing profession and coming up with solutions to current problems that could be resolved by nurses. But mainly to obtain options and flexibility for the characteristics of the nursing workforce and to make sure the health service makes the most of all its staff to improve their services.

CHAPTER I: INTRODUCTION
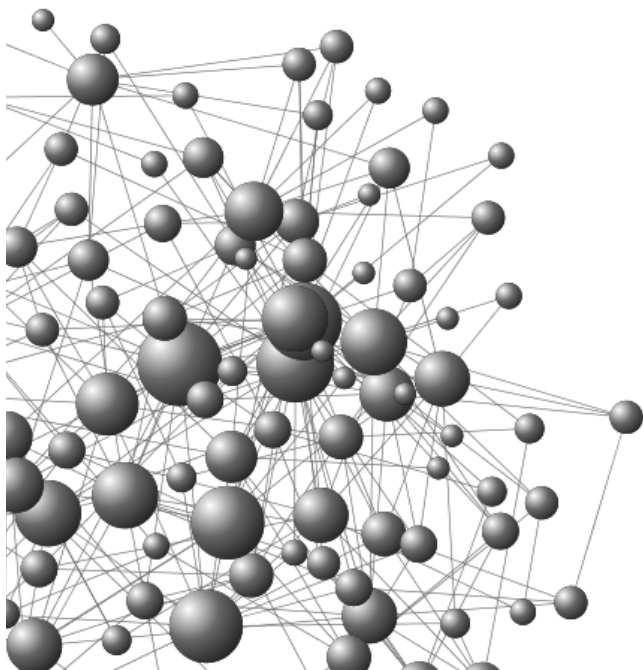
1. The concept of Advanced Practice Nursing

The expansion of health care professionals' fields of practice is a way to healthcare systems has responded to the changing needs of populations. When addressing expanding the role of nurses, Advanced Practice Nursing (APN) is frequently discussed. APN is a general term describing an advanced level of clinical nursing practice that maximizes the use of knowledge acquired in higher education, in-depth nursing knowledge and proven competence in meeting the health needs of certain individuals, families, groups, communities and populations (Association des infirmières et infirmiers du Canada [AIIC], 2008). The international Council of Nurses (ICN) defines an APN as a registered nurse who has acquired the expert knowledge base, complex decision-making skills and clinical competences to practice at an advanced or expanded level, the characteristics of which are shaped by the context and/or country in which he/she is credentialed to practice (ICN International Nurse Practitioner/ Advanced Practice Nursing Network, 2009). A master level degree is recommended for entry level (Schober, 2006).

The concept of APN first emerged in the United States (US) in 1965 (Pearson, 2009). Like in most other countries the APN role began to develop in the late twenty century as a result of the need to contain costs, improve access to care, reduce waiting time, serve the underprivileged and maintain health among specific groups (Sheer & Wong, 2008). Nurse role advancement can take many forms. There are two main broad approaches to APNs: task-shifting and task supplementation. Task-shifting was defined by the World Health Organisation (WHO) as nurses or other non-medical professions taking up clinical activities traditionally performed by physicians (World Health Organization, 2007; World Health Organization, 2008) and which main aim is reduced workload of doctors, improve access to care, and reduce cost. The second approach is task supplementation which refers to nurses taking up clinical roles that did not or only marginally exist before, such as additional roles in coordination, eHealth-supported monitoring or case management, thereby complementing existing roles (Laurant et al., 2005) which are usually related to new services (e.g., quality improvement) and aim to improve services and quality of care.

To account for the broad conceptual approach, this study defines APN as "nurses working in advanced roles beyond the traditional registered general nurses' (RGN) scope-of-practice, after

additional training" (Maier & Aiken, 2016). While the ICN definition (ICN, 2009) is widely used in the literature as an umbrella-term and is internationally recognized (International Council of Nurses, 2002), the extent of advanced clinical practice as per scopes-of-practice and educational characteristics has received less attention in some countries and in cross-country comparisons (Maier, Aiken & Busse, 2017).

The diversity and significance of APN could vary from country, areas and although institutions. However, in countries where task-shifting has occurred and combined with regulatory reforms has led to a considerably expanded practice level (Maier, Aiken & Busse, 2017) beyond traditional RGN.

1.1 Categorization of APNs

The broad concept of the APN role is supported globally (Sheer & Wong, 2008). However, the categories for APN roles is contextually driven at the country and/or organizational level. Internationally, this has resulted in some confusion about what constitutes the role and a plethora of role titles. It is important to differentiate between the various titles and roles that have been used between countries because there are differences in both interpretation and implementation (Chuck, 1997).

One international survey identified 52 different APN role titles such as the clinical nurse specialist (CNS), nurse practitioner (NP), advanced practice nurse, nurse specialist, nurse consultant, nurse midwife, and nurse anaesthetist (Heale & Buckley, 2015). Of these role titles, CNS and NP are the most common (Delamaire & Lafortune, 2010; Schober, 2013).

Other titles included advanced nurse, practitioner, clinical nurse specialist, nurse specialist, professional nurse, expert nurse, certified registered nurse practitioner, chief professional nurse with post-basic training in primary health care, nurse consultant, specialist nurse practitioner, primary healthcare nurse, and advanced nurse in a specialty. Regardless of the type, common characteristics of APN roles have been identified including: completion of an accredited education program designed to produce advanced practice nurses and formal licensure, registration, certification and credentialing (ICN, 2001). Depending on the country-specific regulatory mechanisms, advanced practice nurses may have an expanded scope of practice with title protection and the legal authority to diagnose, prescribe medications and treatments, refer patients to other health professionals, and admit patients to hospital (Figure 1).

Table 1: Nurses in advanced roles: titles, scopes-of-practice and education
(Source: Maier, Aiken & Busse, 2017)

Nurses in advanced roles?	NP/APN level	Sub-groups/ specialisation	Tittles	Scope-of-Practice (SoP)	Education
Yes	Yes	Nurse Practitioner (NP)	NP, Advanced NP or similar title	Advanced SoP: high level of advanced clinical practice°	Master-level*
		Other Advanced Practice Nurses (APN)	Clinical Nurse Specialist, others	Advanced SoP: high level of advanced clinical practice°	Master-level or other postgraduate education*
	No	Various other nursing roles or (sub-) specialities with additional training	Vary, include family nurses, reference nurses, other titles	Some elements of advanced SoP, but not at NP/APN level	Additional training/ education beyond RN education
No		RN, professional nurse	RN, professional nurse	"traditional" SoP of RNs in country context	RN nursing education

Notes: SoP=Scope-of-Practice, NP=Nurse Practitioner, RN=Registered Nurse, *Exceptions may exist, °depending on country context

The major APN roles that an increasing number of countries have introduced are: clinical specialist nurses (CNS), clinical nurse consultant (CNC), certified midwifes, nurse anaesthetist, NP or a blending of one or more of these roles. All roles share important characteristics and there is a general agreement that advanced practice nursing entails the use of specialised knowledge and expert skills to undertake autonomous patient-focused practice (Pulcini & Raisa, 2010). However, considerable confusion exists within the international nursing profession about the terminology

used to describe APN roles, their role functions and their scope of practice (Chang et al, 2010).This ambiguity in nomenclature and role definition could lead to difficulties in the introduction of the APN role (Jones, 2005). Also, previous studies have suggested that role ambiguity is often associated with negative staff, patient and organisational outcomes (Gormley & Kennerly, 2011; Tarrant & Sabo, 2010; O'brien-Pallas, Murphy, Shamian, & Hayes, 2010; Aranda & Jones, 2008). Disparity in APN titles, differing educational requirements, variability in degrees and limited access and scope of practice to these roles are linked with the way contexts have developed and overcome implementation challenges. These challenges can at least in part be explained by the fact that "implementation and context are inextricably linked" (Pfadenhauer et al., 2017; p. 104).

1.2 Spheres of practice

Each place has its own cultural, social and economic context in which advanced practice nurses may exist. The challenge is to clearly define the role, to provide the necessary education and to establish the scope of advanced practice and regulations. Experiences in other countries show that advanced practice nurses arise as a result of the need to reduce costs, improve access to health care, reduce waiting lists, care for the most disadvantaged and maintain health in certain groups sometimes as a result of the lack of medical doctors in some areas. Role delineation studies, or job analysis, are a necessary step in describing current practice expectations, performance requirements, and job environments. It is done to identify essential activities, knowledge and/or skills required to be a competent professional in the chosen field. Role delineation studies support the content that should be measured, and it is an indicator of continuing education, leadership, professional growth and safe practice (Willens, DePascale, Penny, 2010). Nursing leaders try to respond to new demands extending the practice of nurses and introducing a higher level of care. Because they advanced practice is a new role and the services provided are novel, difficulties on the legality of the practices may emerge. Many countries have overcome these problems and by granting privileges to these nurses such as prescription drugs or diagnostic test requests by implementing clinical protocols where the law is not established (William et al 2000; Wong & Chung, 2006) although this is only an interim measure. The purpose is to establish legislation to standardize advanced practice nursing.
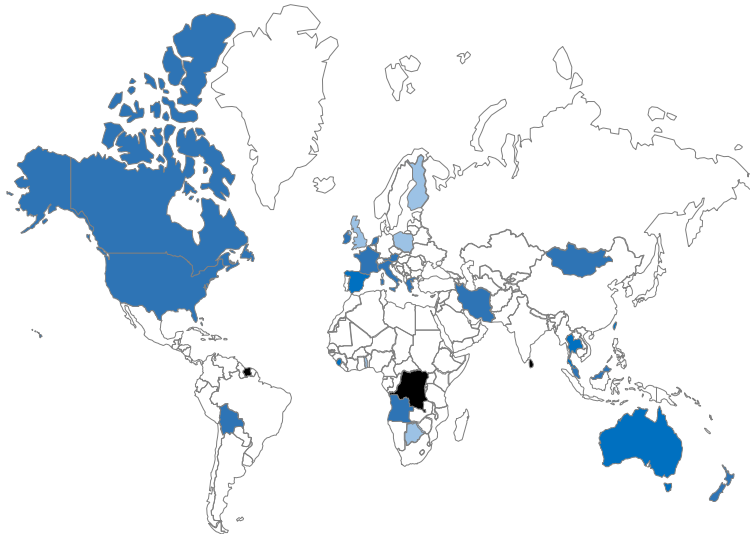
Phillips (2006) suggests that this development process can take decades to settle. Given the links described earlier between role ambiguity and negative organisational and patient outcomes, it should be a priority for health services to ensure that nursing staff have a clear understanding of their roles and expectations. In an effort to reduce role confusion and ambiguity, this study sought to translate, adapt and validate a role delineation tool which explores and evaluate the scope of practice in advanced practice nurses and to determine the extent to which practice was consistent with the advanced practice domains. In a moment where APN roles are emerging in our area, calls for clarification of APN roles, with global agreement that delineates the activities APNs undertake is necessary to define the role (Por, 2008).

Although clinical practice involving the direct and indirect care of patients and their families, groups, communities or populations is the primary focus of APN roles, other APN role responsibilities include the education of nurses and other health professionals, evidence-based practice and research, organizational leadership and optimization of health systems (Matsoukis and Watkinson, 2007). It is the combined effect of these multi APN role responsibilities that leads to innovation, health care improvement and its sustainability.

1.2.1 Scope of clinical practice

Practice in this domain includes activities carried out on behalf of individual patients/clients focusing on specific needs, including procedures, assessments, interpretation of data, provision of physical care and counselling. Clinical Care also includes care coordination, care delivery, and guidance and direction to others relevant to a specific patient population.

1.2.2 Education

These are activities that involve enhancement of caregiver, student and public learning related to health and illness. This also includes aiding patients and families to manage illness and to promote wellness, staff development and formal presentations to healthcare professionals

1.2.3 Research and evidence-based practice

Activities that support a culture of practice that challenges the norm, that seek better patient care through scientific inquiry and promote innovative problem solving to answer clinical questions. This includes conducting clinical research, obtaining funding sources and using the best evidence to guide practice and policy.

1.2.4 Leadership

Activities and attributes that allow for sharing and dissemination of knowledge beyond the individual's institutional setting. These activities promote nurses, nursing and healthcare and include disseminating nursing knowledge, serving in professional organizations, and acting as a consultant to individuals and groups. Leadership also includes setting directions and modelling standards towards optimizing population and patient care outcomes.

1.2.5 Optimization of the health system

This domain includes activities that contribute to effective functioning of health systems and the institutional nursing service including role or patient's advocacy, promoting innovative patient care and facilitating equitable, patient-centered health systems and cost-effective care.

2. Theoretical development of advanced practice

Different models of APN have been developed over time (Ackerman et al., 1996; Shuler et al., 1993). However, theoretical development, at that time, had been base on personal, academic or policy assumptions which sought to meet the requirements of the academic curriculum or policy development (Ball & Cox, 2003).

2.1 Strong Memorial Hospital's Model of Advanced Practice Nursing

APNs at Strong Memorial Hospital developed a model of advanced practice nursing (Ackerman, Clark, Reed, Van Horn, & Francati, 2000; Ackerman, Norsen, Martin, Wiedrich, & Kitzman, 1996; Mick & Ackerman, 2000). The model evolved from the delineation of the domains and competencies of the Acute Care NP (ACNP) role, conceptualized as a role that "combines the clinical skills of the NP with the systems acumen, educational commitment, and leadership ability of the CNS" (Ackerman, Norsen, Martin, Wiedrich, & Kitzman, 1996, p. 69). Their goal was to characterize the CNS role and delineate the role from that of the nurse practitioner. Five domains of practice and their related activities were described based on the American Association of Critical Care Nurses' position statement on the role of the CNS. These five domains are direct comprehensive patient care, support of systems, education, research, and publication and professional leadership. All domains have direct, and indirect activities associated with them.

Figure 2: The Strong Memorial Hospital's model of advanced practice nursing
(Source: Ackerman et al., 1996)
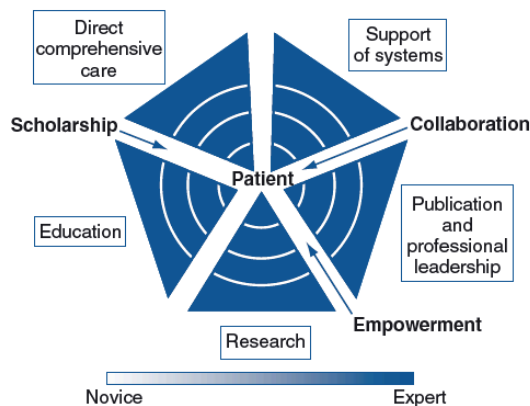
In addition, necessary unifying threads influence each domain, which are illustrated as circular and continuous threads in Figure 2. Further work identified the Strong Model of Advanced Practice (Ackerman, Norsen, Martin, Wiedrich, & Kitzman, 1996) as having the potential to delineate the parameters of practice for the APN role.

2.2 Hamric´s Model

One of the earliest efforts to synthesize a model of advanced practice that would apply to all APN roles was developed by Hamric (1996). Hamric, whose early conceptual work was done on the CNS role (Hamric & Spross, 1983; Hamric & Spross, 1989), proposed an integrative understanding of the core of advanced practice nursing, based on literature from all APN specialties (Hamric, 1996; Hamric, 2009). Hamric proposed a conceptual definition of advanced practice nursing and defining characteristics that included primary criteria (postgraduate education, certification in the specialty, and a focus on clinical practice with patients) and a set of core competencies (direct clinical practice, collaboration, guidance and coaching, evidence-based practice, ethical decision making, consultation, and leadership).

Figure 3: Hamric´s Model of Advanced Practice Nursing (Source: Hamric & Spross, 1989)
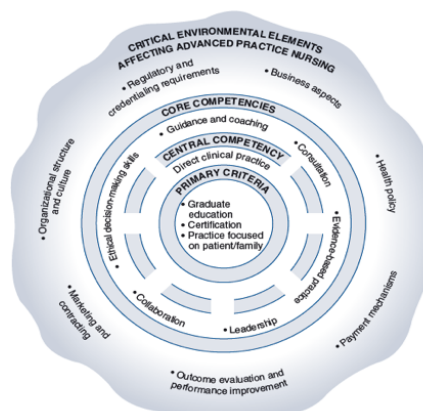
This early model was further refined, together with Hanson and Spross in 2000, based on dialogue among the editors. Key components of the model (Figure 3) include the primary criteria for advanced nursing practice, seven advanced practice competencies with direct care as the core competency on which the other competencies depend, and environmental and contextual factors that must be managed for advanced practice nursing to flourish.

2.3 Learning development Framework

The Learning Development Framework (Bryant-Lukosius et al., 2016) is used to evaluate different types of APN roles as they evolve to meet dynamic population health, practice setting, and health system needs was created. It includes a matrix of key concepts to guide evaluations across three stages of APN role development: introduction, implementation, and long-term sustainability. For each stage, evaluation objectives and questions examining APN role structures, processes, and outcomes from different perspectives (e.g., patients, providers, managers, policy-makers) were identified. The Learning Developing Framework (**Error! Reference source not f ound.**) promotes systematic and appropriately timed evaluations by defining evaluation objectives for each stage of role development. The objectives facilitate focused and feasible evaluations and avoid premature outcome assessments of underdeveloped roles. This strategy is exemplified in the case study where outcomes such as cost effectiveness are evaluated in the long-term sustainability stage. The framework fosters comprehensive evaluations to inform implementation strategies and improve understanding about role impact by examining structures, processes, and outcomes relevant to APN competencies (G. Gardner, A. Gardber & O'Connell 2013).

Figure 4: Evaluation framework matrix—key concepts for evaluating advanced practice nursing roles (Source: Denise Bryant-Lukosius et al., 2016)
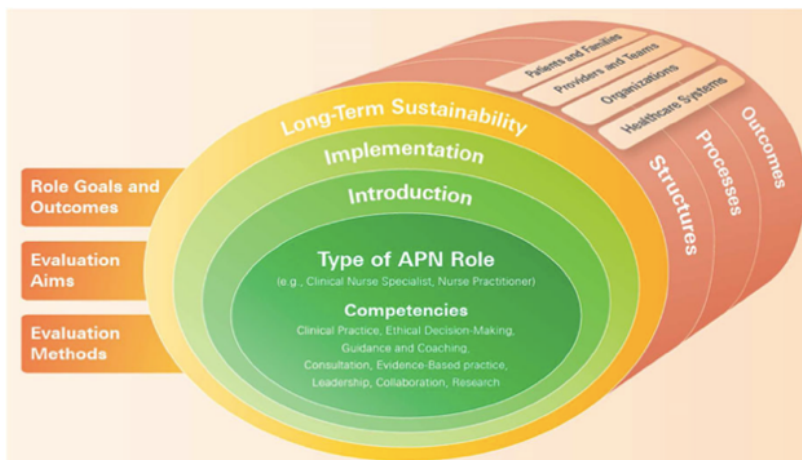
3. International APN role development

To advocate for fundamental redesign of the USA health care system, The Institute of Medicine published the report, Crossing the Quality Chasm—A New Health System for the 21st Century (IOM, 2001), in a widespread attempt to transform the healthcare system to achieve the triple aim of improved health, improved patient experience, and reduced cost of care (Berwick, Nolan & Whittington, 2008). Primary care practices across the USA are engaged in improvement initiatives, including demonstration projects to implement patient-centered medical home principles (Nutting, 2011) or new models of care delivery, such as integrating primary and behavioural healthcare (Kathol, 2014). Nevertheless, in 2010 the Institute of Medicine published the report, The Future of Nursing: Leading Change, Advancing Health (IOM, 2010), which examines how nurses' roles, responsibilities and education should change to meet the needs of an aging, increasingly diverse population and to respond to a complex, evolving health care system. The recommendations focus mainly on the critical intersection between the health needs of patients and the readiness of the nursing workforce, and along many suggestions, it recommends eliminating the barriers for implementation of new innovative nursing roles such us APNs. The Future of Nursing report states that "outdated regulations and organizational and cultural barriers that limit the ability of nurses to practice to the full extent of their education, training, and competence" must be eliminated. It also recommends that current disagreements regarding APNs and inconsistencies of what they are competent to do and what they are able to do based on regulations must be resolved. Nowadays, healthcare organizations, researchers, funders, and policy makers have a unique opportunity to learn from both interventions and natural experiments (Davies et al., 2013) to improve services to current population needs.

Exists great concerns about shortages of health workers and access to care, particularly in primary care, concerns about patient safety and quality of care and concerns about growth in health spending (and how to finance it, given the need to reduce budget deficits). APNs are considered to play an important role in helping to alleviate the shortage of human resources in health care in both developed and developing countries (ICN, 2005). The OECD has looked at skill mix and a possible re-definition of roles of doctors and nurses in recent reports (Glinos, 2016). Skill-mix reforms are receiving widespread interest in health workforce policy to improve performance and productivity, to fill skill gaps (disease-specific, support roles), to respond to modern needs and to find right balance in current healthcare systems. Policy-makers are increasingly recognizing the need to align the size, composition,

competencies and performance of their health workforce with increasing and diversifying population needs, and against the backdrop of rapidly changing health systems. Primary care provider models in many countries have been for decades acute care focused and physician-centered in solo- or small group practices. Yet, the rise in chronic conditions has triggered changes to service delivery models. New and more time-consuming tasks and new skill-sets are required from healthcare teams. In many countries, changes to payment mechanisms are increasingly incentivizing quality of care, including coordination of care and team work.

Also, several countries are facing workforce challenges, particularly in primary care. The WHO (2016) has already reported that to manage the impacts of migration, ageing populations and rise of chronic diseases, the world needs 9 million more nurses and midwives by 2030. These staff shortages can include existing or projected shortages of certain professions and specializations, geographical maldistribution, different work-life priorities among the new generation of health professionals resulting in lower working hours, and workforce management and performance-related challenges. As a consequence, countries are adapting the composition of their primary care workforce. One strategy is to advance the roles of nurses or other non-physician providers by expanding their skills and clinical activities in healthcare. There is a strong consensus regarding the potential benefits linked with the implementation of APN roles. But despite the abundance of evidence on the effectiveness and safety of APN roles', its development and implementation has historically presented significant challenges (Andregård & Jangland, 2014; DiCenso et al., 2010). Over the past few years, there has been an increased focus on understanding the advanced practice nursing role. This has been driven by the rapid increase in the number of new advanced practice roles introduced internationally (Ruel & Motyka, 2009; Bryant-Lukosius et al., 2004), as well as research findings from pioneer countries such as the US, Canada, United Kingdom and Australia demonstrating that advanced practice roles enhance service delivery and improve patient outcomes (Snooks & Nicholl, 2007; Salisbury & Munro, 2003; Szafran & Bell, 2000). There are approximately 50 nations where advanced practice nurses have developed their role (Schober & Affara, 2006; Sheer, 2007) for instance the Netherlands in Europe. This international trend is the result of the dynamic changes in health care and in the development and adaptations of nursing care to them. The emergence of new advanced nursing roles requires new multidisciplinary efforts and contribution of new advanced practice nurses to improve access to patient care in cost-effective ways. Several investigations have been conducted to determine the

value of advanced practice nursing. In the USA, Brooten et al. (2002) has confirmed that the contribution of advanced practice nurses in a large group of patients have positive health outcomes.

In Canada, Higuchi et al. (2006) published the improvement of health in a rural adult group through the introduction of advanced practice nurses in geriatrics. This clinical evidence may influence health officials to include advanced practice nurses as key partners in the health team. Other studies have also shown that advanced practice nurses contribute to positive outcomes such as reduce the cost of care and improve patient satisfaction (Wong, Mok, Chan, & Tsang, 2005) and has even been shown that the quality of care may be similar and even better in some respects to that of doctors in areas such as primary care, as outlined by the Cochrane review group (Laurant et al., 2005).

Table 2: Tittles for APN (Source: Pulcini et al. 2010)

Titles for Advanced Practice nurses (91 respondents from 32 countries)	Frequency	%
Nurse Practitioner	38	44%
Advanced Practice Nurse	15	17/
Advanced Nurse Practitioner	9	10%
Clinical Nurse Specialist	7	8%
Nurse Specialist	4	4%
Professional Nurse	2	2%
Expert Nurse	1	1%
Certified Registered Nurse Practitioner	1	1%
Chief Professional Nurse with post-basic training in Primary Health Care	1%	1%
Nurse Consultant	1%	1%
Specialist Nurse Practitioner	1%	1%
Primary Healthcare Nurse	1%	1%
Advanced nurse in a specialty	1%	1%

3.1 Context of APN in Catalonia, Spain

Life expectancy in Catalonia is higher than in other Spanish and European regions; men live an average of 80,4 years while woman live an average of 85.9 years of age (Idescat, 2015) and according to data from the Catalan Autonomous Government (Generalitat of Catalonia), 32% of the population is over 65 years old (Gencat, 2012). These social and demographic changes in addition to the increased efficiency of clinical resources have challenged the health care system's ability to provide efficient

and effective continuing of care, especially in long-term conditions (McKee, 2009). The Catalan health care system is in a process of change where the 2016-2020 Healthcare Plan has been recently reviewed by the Ministry of Health (2016). This Healthcare Plan focus on lines of action which are of greater relevance in terms of transforming the model of care such us orientation towards long-term conditions, greater resolution and accessibility, quality in high specialization and interdisciplinary public health. In many cases, it involves collaboration between multiple factors, changes in professional roles and restructuring of organizations. This shift of the population requires structural changes in nursing practice that reflect evidence-based care and best practices. Catalonia shares the confusion with the international nursing profession regarding functions and nursing roles in the health care system. There is an important lack of knowledge about the academic nursing development, competences and practice of different nurse's level.

Currently in Catalonia this model of advanced practice nursing is undeveloped and difficult to develop in the absence of legislative support. In clinical practice, the development of new pathways and the implementation of governmental programs have originated alternative models of care and the creation of new nursing roles. The evolution of new roles shares the confusion with the international nursing profession regarding functions and domains in the health care system. These new emerging expert nursing roles in our area could be similar to the international roles of APNs, however, there is an important lack of knowledge about their professional and academic development. Currently, in Catalonia the accredited model of advanced practice nursing is non-existent and difficult to develop in the absence of legislative support. The most similar to the international nurse practitioner figure would be the case manager nurse, which, is integrated into the map of health resources in primary care in some Spanish regions. For the past 10 years, Spanish nursing education has gone through a great transformation, from a university diploma-only program to a full-scale academic education with a degree, masters and PhD programs (Zabalegui & Cabrera, 2009) so nurses could achieve the knowledge, skills and attitudes required to effectively cope with current health care challenges. Also, nurses can obtain a fully recognized higher level of professional qualification to establish specific training in a particular field of practice such us the 7 existent specialties: obstetrics and gynaecology nursing/ midwifery, mental health nursing, community nursing, paediatrics nursing, geriatric nursing, medical-surgical nursing and occupational health nursing. In order to be admitted into one of the nursing specialist training, general nurses sit a competitive state-run examination. Nurses who obtain the higher

qualifications in the state-run exams are admitted into a two-year residence training system in the clinical area, through a paid internship contract. Some studies have concluded that the development model of the specialist nurse in Spain corresponds to the development model of APNs in other countries (Giménez Maroto, 2013). In addition, a reduced number of universities provide the qualifications of master's degrees in Advanced Practice Nursing. Generally, official master's programs do not have harmonized curricula across the country related with APN however Official master programs have the endorsement of the university which grants them and European recognition.

Both, specialist training and advanced practice programs, provide an educational choice for nurses who want to further develop their knowledge, abilities and skills in advanced competences however the choice could vary from an exclusive clinical-based training which final responsibility for assessment sets on the Ministry of Health (with the specialty residency program) to a fully academic higher educational program with usually non-mandatory clinical practice for APNs which requires students to be working in the area of interest and that final responsibility for assessment sets on the Ministry of Education. As the APN term has not been recognized or protected in Spain, adds to the international confusion of the educational requirements and needs regarding professional knowledge, skills and competences. Furthermore, although the governmental recognition of the nursing specialities and master programs with exception of midwifery job positions most of the time nurse specialists and developing roles of APNs do not have access to specific job positions in clinical practice. The development of expert nursing roles in Catalonia usually has begun with service demand, the existence of educationally prepared nurses and the demands of their patient population. These nurses have usually been supported by their unit managers, multidisciplinary team or other external funding such as pharmaceutical companies to fulfil governmental health programs or hospital health plans created by leading professionals in different conditions. But what type of knowledge, skills and ability have to have these new emerging advanced practice roles to be efficient and effective in their practice and how many of them are required to cover the necessity of the changing population? The complexity of advanced practice activities and functions has to be taking into account as well as the nursing perceptions and the current biomedical model of care.

CHAPTER II: FRAMEWORK OF REFERENCE
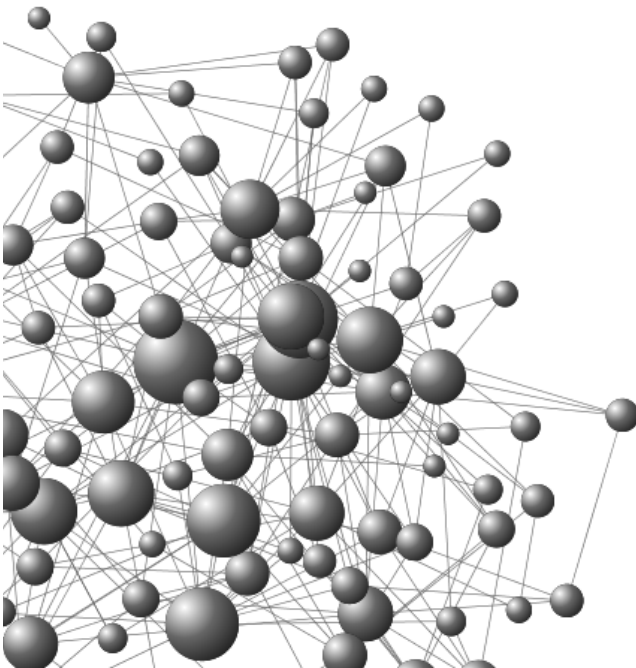
4. Implementation Research

Implementation research is a powerful tool for capturing and analyzing information in real time, allowing for the assessment of performance and facilitating health systems strengthening (Peters, Tran & Adam, 2013). Interest in the area is growing, largely in recognition of the contribution it can make to maximizing the beneficial impact of health interventions, but issues could arise as a result of a range of factors including 'real world' contextual factors that are either overlooked or not captured by other research disciplines (Ross, Baker & Denis, 2011).

Implementation research it is the scientific study of methods to promote the systematic uptake of proven clinical treatments, practices, organizational, and management interventions into routine practice, and hence to improve health (Eccles & Mittman, 2006). In this context, it includes the study of influences on patient, healthcare professional, and organizational behavior in either healthcare or population settings (Implementation Science Journal). It is the study of the processes used in the implementation of initiatives as well as the contextual factors that affect these processes. One major purpose of implementation research is to support and promote the successful application of interventions that have been demonstrated to be effective. This is particularly important in supporting the scale-up of interventions and its integration into health systems at the national level.

Despite abundant evidence of the efficacy of affordable, high-quality interventions by APN, there is little understanding of how to develop and implement APN effectively in diverse settings and within the wide range of existing global health systems. Implementation issues often arise as a result of contextual factors that policy-makers and health system managers may not even have considered. Implementation research is crucial to improving our understanding of the challenges that APN face in confronting the real world by broadening and deepening our understanding of these real-world factors and how they impact implementation of the new professional roles and practices in nursing.

Intertwined with the implementation process of APN are its environment and context so concentrating on what unify groups of people could assist to gain a greater understanding of the social, infrastructural, economic, and environmental complexity of the context in which the implementation of the innovation will take place. The push towards scaling-up and spreading APN internationally are significantly slowed by the lack of understanding about what contextual elements should be considered to

achieve successful implementation. Similarly, grasping how implementation affects local, organizational and national contexts can be essential to better predict and measure the impact of the transformation and expansion of nursing practices. Implementation research could be of immense value in shining a light on the often-bumpy interface between what can be achieved in theory and what happens in specific local practices across the globe.

Accordingly, imposing traditional scientific principles and a priori specifications on evaluation design may constrain our ability to pay attention to context and transportability (Balasubramanian, 2015). The study has its foundations on the idea that a complete understanding of innovation, such as APN roles, requires a multilevel analysis between diverse agents and across levels (Zhao, 2014). And in order to facilitate the ongoing challenge of capturing and understanding on innovative nursing roles, this study used the Learning Evaluation approach (Balasubramanian, 2015) which blends quality improvement and implementation research methods to study healthcare innovations, such as new APN roles and interventions.

4.1 Learning Evaluation Framework

Capturing and understanding innovation dynamics is an ongoing challenge because of the difficulty of collecting process data and because it often involves multiple levels and units of analysis (Langley, 1999; Zhao, 2014).

The Learning Evaluation is an approach to multi-organization assessment that uses mixed methods research to conduct real-time assessment of implementation processes while also assessing changes in context, facilitating quality improvement and generating transportable lessons (Balasubramanian, 2015). This approach blends quality improvement and implementation research methods with an emphasis on drawing systematic and transportable lessons from healthcare innovations implemented across multiple organizations in changing, real-world settings. Two key aspects of this approach set it apart from other evaluation approaches; its emphasis on facilitating learning from small, rapid cycles of change within organizations and on capturing contextual and explanatory factors related to implementation and their effect on outcomes across organizations. The overarching idea underlying Learning Evaluation is that assessment needs to be flexible, grounded, iterative, contextualized, and participatory in order to foster rapid and transportable knowledge. It is designed to balance the flexibility needed for within-system innovation and the

structure needed to support rigorous evaluation, cross-organization learning, and generate transportable findings.

Table 3: Principles underlying the Learning Evaluation (Balasubramanian, 2015).

PRINCIPLES	REASON TO ASSESS PRINCIPLE	WAYS TO ASSESS PRINCIPLE
Principle 1: Gather data to describe types of changes made by healthcare organizations, how changes are implemented, and the evolution of the change process	To establish initial conditions for implementing innovations at each site and to describe implementation changes over time	- Interview with healthcare organizations to establish detailed understanding of the plan for implementing change at baseline by engaging organizational leaders - Use mixed methods to monitor how this plan evolves
Principle 2: Collect process and outcome data that are relevant to healthcare organizations and to the research team	To engage healthcare organizations in research and in continuous learning and quality improvement	- Identify target populations and process and outcome measures of interest to organizations - Identify relevant process measures to track for selected target populations - Track performance on selected measures at regular time intervals throughout implementation
Principle 3: Assess multi-level contextual factors that affect implementation, process, outcome, and transportability	Contextual factors influence quality improvement; need to evaluate conditions under which innovations may or may not result in anticipated outcomes	- Collect qualitative and quantitative contextual data in real time - Conduct rigorous analysis to identify key contextual factors affecting outcomes
Principle 4: Assist healthcare organizations in applying data to monitor the change process and make further improvements	To facilitate continuous quality improvement and to stimulate learning within and across organizations	- Synthesize, summarize, and share data with organizations at regular intervals - Discuss data with leaders to stimulate further improvement - Assist organizations in learning from their own data to refine their innovations with a focus on continuous learning.
Principle 5: Operationalize common measurement and assessment strategies with the aim of generating transportable results.	To conduct internally valid cross-organization mixed methods analyses	- Create a set of common measures relevant to all organizations (e.g., screening rates). This allows meaningful statistical and qualitative comparisons across organizations - Harmonize process and outcome measures across organizations by engaging organizational leaders

Five principles are the foundation of this approach (Table 3): (1) gather data to describe changes made by healthcare organizations and how changes are implemented; (2) collect process and outcome data relevant to healthcare

organizations and to the research team; (3) assess multi-level contextual factors that affect implementation, process, outcome, and transportability; (4) assist healthcare organizations in using data for continuous improvement; and (5) operationalize common measurement strategies to generate transportable results (Balasubramanian, 2015). Learning Evaluation aligns with the quality improvement process and provides a clinically relevant and realistic way to evaluate health system changes. This approach is especially relevant for policy makers; it is ideally suited for evaluating demonstrations of new initiatives in which it is critical to assess context in which changes occur so that dissemination can be targeted to healthcare systems positioned to deliver new models of care. For the purpose of this study the Learning Evaluation approach assist to generate systematic and rigorous cross-organizational findings about implementing APN while also enhancing organizational capacity and accelerating translation of findings. The study integrated the evaluation of APN change initiatives and healthcare organizations improvement initiatives while analyzing the context of APN implementation.

4.2 Context Analysis

There are multiple ways to analyse context in order to gain knowledge about APN development and implementation that goes beyond borders. Within this research project context was conceptualized as a set of characteristics and circumstances that consist of active and unique factors that surround the implementation. As such, context it is not a backdrop for implementation but interacts, influences, modifies and facilitates or constrains the intervention and its implementation. Context actively interacts with implementation and not only refers to the setting but interactions and relationships as well (May, Johnson, & Finch, 2016).

One element regarding the difficulty to fully grasp contextual components and their dynamics is related to the way that context is conceptualised and the framework that is used. The way that studies conceptualised context could be the cause of difficulties to truly understand its' dynamics with implementation.

The research study posed that the object of implementation, whether it be a new knowledge, a new intervention or a new role, would not affect the potential relevance of the tool for the study needs. Five frameworks related to context were identified and described in Table 4: Barriers scale (Funk, Champagne, Wiese, & Tornquist, 1991), The Consolidated Framework For Implementation Research (CFIR) (Damschroder et al., 2009), The Alberta Context Tool (Estabrooks, Squires, Cummings, Birdsell, &

Norton, 2009), The Astire Tool (Cambon, Minary, & Alla, 2013) and The Context and Implementation of Complex Interventions (CICI) framework (Pfadenhauer et al., 2017). Furthermore, in some frameworks or tools context is showing just beneath the surface whereas in others it was plainly the main focus. These frameworks were appreciated to see if one of them appeared to have better potential of highlighting the dynamics of context and implementation. Regardless of the different dimensions and items suggested by these different frameworks or tools, documenting everything linked with context and, furthermore, understanding how each of these dimensions and items are interacting remains a daunting task. The context in which health care practice occurs can also seem infinite (Richards & Hallberg, 2015). Knowing that gaining a comprehensive understanding of the emergence of an innovation, such as the implantation of new nursing roles, requires analysis on multiple levels among the various actors and levels (Pfadenhauer et al., 2015), the motivation for implementation includes key personal, organizational, and cultural drivers/incentives of change at multiple levels (Tomoaia-Cotisel et al., 2013). More specifically, the interest of study was in understanding the dynamics and the "rules of motion" between and within contextual elements. Although it is difficult to represent graphically, the research interest lies mainly in the white space between and within real-world phenomena and contextual elements. This recognizes scientifically that understanding the process of innovation is an intrinsically dynamic phenomenon that requires dynamic theories (Zhao, 2014). Research on innovations has been criticized for being sequential, linear, or unable to gain an understanding of the dynamics of innovation in context (Nilsen, 2015). Within the study, in order to further understand context, the Tomoaia-Cotisel et al. (2013) framework was used to encompass three levels: practice, larger organization and the external environment, and to illustrate that through these levels the implementation pathway and the motivation for implementation can also inform on the context (Tomoaia-Cotisel et al., 2013) (of coordination/involvement with community (e.g., state-wide project, multiplayer, project, collaborative, advocacy), payment models available (e.g., fee for service, capitated, pay for performance, care management, payment), educational system, and unionization (Tomoaia-Cotisel et al., 2013). At the practice level is recently analysed the team model, its composition type, the size and diversity of clinicians and employees, demographic characteristics of clinicians and employees, training clinicians and employees, the size and characteristics of the cohorts of patients besides its history, experience, learning capacity, intra-team power relations,

objectives and methods, autonomy of the teamwork, knowledge management, time management, distribution of labour and specialization (Tomoaia-Cotisel et al., 2013).

Table 4: Context frameworks and tools

	NAME OF THE FRAMWORK/ TOOL				
Characteristics	**Scale**	**The Consolidated Framework for Implementation Research (CFIR)**	**Alberta Context Tool**	**ASTIRE**	**The Context and Implementation of Complex Interventions (CICI) Framework**
Authors	Funk, Champagne, Wiese, & Tornquist, 1991	Damschroder et al., 2009	Estabrooks et al., 2009	Cambon, Minary, Ridde, & Alla, 2013	Pfadenhauer et al., 2017
Aim	To identify barriers to research use	To promote implementation	To assess context validly and reliably within complex healthcare settings where care is provided to patients.	A tool to analyze the transferability of health promotion interventions	Facilitate the structured and comprehensive conceptualisation and assessment of context and implementation of complex interventions
Description	Inspired by the diffusion of innovation	Overarching typology theory development and verification about what works where and why across multiple contexts.	Centred on the context domain, viewed as a part of the PARiHS framework that provides a broad conceptualization of how research implementation occurs in organizational settings(Kitson, Harvey, & McCormack, 1998)	Framework and tools	Framework and tools
Number of items	28	29	56-58	23	12
Domains	Characteristics of the adopter	Characteristics of the individuals involved	Leadership	Population	
	Characteristics of the organization	Inner setting	Culture Social capital		Setting
	Characteristics of the innovation	Intervention characteristics	Evaluation		
	Characteristics of the communication	The process of implementation	Informal interactions Formal interactions Structural/electronic resources	Implementation Support for transfer	Implementation
	Characteristics of the organization	Outer setting	Organizational slack (comprising three concepts: staff, time and space)	Environment	Context

At the organizational level is recently analysed the organizational authority system, financing, strategy, knowledge management, support system, provision of feedback, provision of training, continuing education, inter-organizational competition. Besides its necessary to explore the organizational resources, structure, reward system, communication systems, competing priorities (what else is going on in the organization, and when? e.g. implementation, midway, financial crisis, financial health of practices, applying for recognition), degree of integration (e.g., insurance, hospital system, specialty care, primary care…), and contractual arrangements (e.g., public payers, private payers, payment models such as the extent of capitation) (Tomoaia-Cotisel et al., 2013).

At the environmental level is recently analysed the market environment (e.g., competition), community characteristics (e.g. level of urbanization, availability of transport), political authority, external financial support, level of coordination/involvement with community (e.g., state-wide project, multiplayer, project, collaborative, advocacy), payment models available (e.g., fee for service, capitated, pay for performance, care management, payment), educational system, and unionization (Tomoaia-Cotisel et al., 2013). Notwithstanding the object on which the research is focused, the research team considered that the difficulty in extracting the dynamics between context and implementation may be caused by the research design used in itself. Balasubramanian (2015) explains that imposing traditional scientific principles and a priori specifications on evaluation design may constrain the ability to pay attention to context and transportability. This idea led to explore the linked context with a dynamic research design such us Network Analysis (NA).

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4.2.1   Network Analysis

Network analysis is an approach that allows studying and understanding the functioning and performance of networks (Wasserman & Faust, 1994). It focusses

specifically on patterns and links between actors, groups, organizations, documents, objects and other entities of information. This research design is centred on the idea that the world is composed by networks, not groups (Wellman, 1988) and that many activities in our complex societies occur in "networks" that involve interdependencies (Mandell, 1984). Used within the field of implementation it is also base on the idea that there are a number of social processes that are necessary in getting programs adopted, implemented, and sustained (Valente, Palinkas, Czaja, Chu, & Brown, 2015). For example, Valente et al. (2015) states three that "relate directly to networks and program effects are: (1) partnerships between researchers, community, policy makers, and practitioners that support implementation, (2) intervention agents (i.e., those who deliver the program), implementation agents, and intermediaries (i.e., those who support the delivery of the program), and (3) the social context of how people receive the program". This research design linked with network analysis that has been used to explore a wide range of structural and relational health aspects and public health systems (Contrandriopoulos et al., 2016). A systematic literature review identified a wide range of areas where network analysis was used (Chambers, Wilson, Thompson, & Harden, 2012). Network analysis aims on modeling and measuring relationships and information flows between actors-people, groups, organizations, documents, objects and other information entities. Modelling networks can explain how the actors interact with each other, how they relate, who are the most influential, and how the fact of belonging to one group or another impacts their behavior. Network analysis has emerged as a key technique in modern social sciences, including sociology, economics, political science, communication studies and organizational studies. It has also gained an increasingly significant support in physics and biology among others. In the last decade, health has also begun to be introduced (Valente, 2010). At present the theory of network analysis is a mature science from its scientific approach since it is based on the mathematical theory of networks.

The power of network analysis is due to its difference from traditional social science studies, which assume that the attributes of each of the actors are the key to understanding their behavior. Network analysis offers an alternative vision, where the attributes of individuals are less important than their relationships and links with other actors within the network. This approach has been very useful in explaining many real-world phenomena, leaving less space for individual action because a large part of information is based on the structure of the network (Newman, 2010).
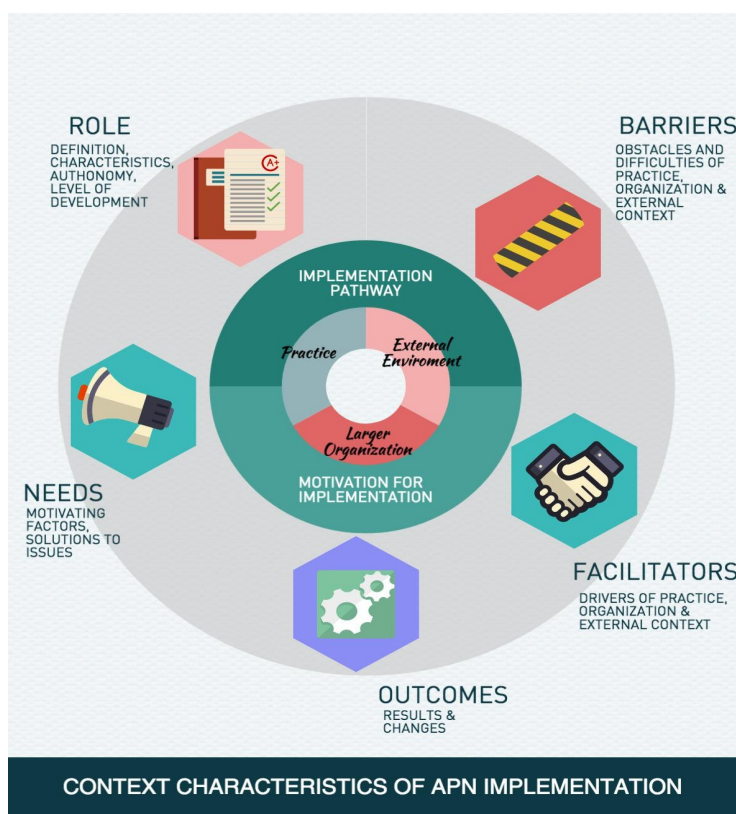
Considering that Mischen et al. (2008) reported that several authors have made important connections between complexity theory and network analysis, and also between network analysis an policy implementation, policy implementation and knowledge management, and knowledge management and complexity theory, the research study uses network analysis design to help shed better light on the interrelations between context and implementation of APN.

Innovation processes and complex interventions such as APN need a deep understanding of the theoretical foundations that underlie and explain their capacity to produce an effect or not. From this standpoint, the APN context in Catalonia becomes a major determinant of the potential impact of the role. Capturing and analyzing information through an implementation research study allows to define the performance on APNs and explore the driving context to strength the Catalan health system. Evaluation of contextual factors is key for successful transfer of knowledge and implementation of APNs. Capturing the current extend of advanced practice and

the different contextual dimensions that influence the development of these roles may support organizations in creating environments that facilitate the uptake of evidence in nursing practice to improve their outcomes. In order to understand current practice and context, the study aims to evaluate the implementation of advanced practice nursing in Catalonia, Spain by exploring different data resources at different levels and context dimensions.

CHAPTER III: AIM AND OBJECTIVES
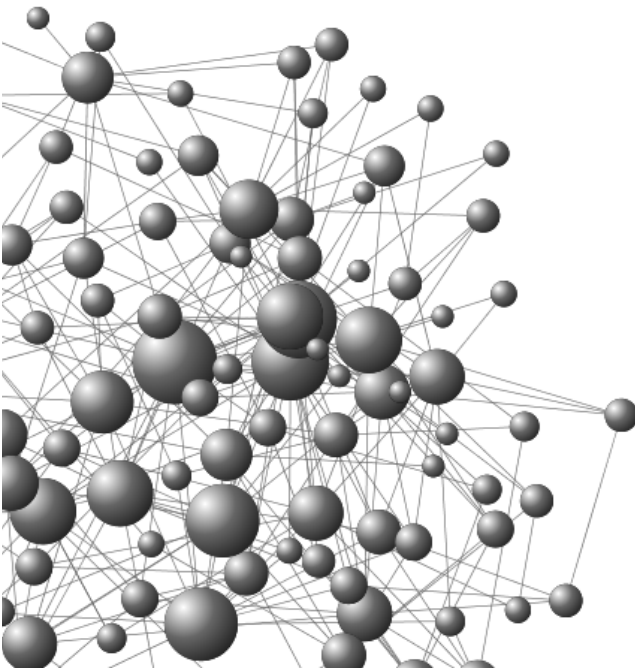
Main aim:

To evaluate the implementation of Advanced Practice Nursing in Catalonia, Spain.

Objectives:

1.1. To identify and analyse the existing instruments that allow to define the domains of Advanced Practice Nursing

1.2. To translate, retro-translate, adapt and test the psychometric properties of the Spanish version of the Modified Advanced Practice Role Delineation (APRD) tool in Spanish healthcare nurses.

1.3. To describe the profile of Advanced Nursing Practice in Spain. To explore the extent and the patterns of advanced practice activity according to nurses'/midwives' age, current position, years of experience, nursing grade and educational level.

1.4. To analyse the contextual network characteristics in the implementation of Advanced Practice Nursing in Catalonia

1.5. To explore and compare the contextual factors that influence the development and implementation of Advanced Practice Nursing in two countries, Canada and Spain.

CHAPTER IV: CIENTIFIC PUBLICATIONS

CIENTÍFIC PUBLICATIONS

1   **"Analysis instruments for the performance of Advanced Practice Nursing"**
Published in Enfermería Clínica. 2017.
Impact factor 0,245. According to SCImago Journal Rank (SJR) 2017.

2   **"Spanish version of the Modified Advanced Practice Role Delineation tool, adaptation and psychometric properties"**
Published in *International Journal of Nursing Practice*. 2017.
Impact factor 1,018. According to the Journal Citation Report (JCR) 2016.
Quartile 3: Nursing

3   **"Profile of advanced nursing practice in Spain: A cross-sectional study"**
Published in *Nursing & Health Science*. 2017.
Impact factor 1,27. According to the Journal Citation Report (JCR) 2016.
Quartile 2: Nursing

4   **"Contextual factors of Advanced Practice Nursing development: A Network Analysis.**
Under review *Nurse Education Today*.
Impact factor 2,5. According to the Journal Citation Report (JCR) 2016.
Quartile 1: Nursing

5   **"Context and implementation of advanced nursing practice in two countries, an exploratory qualitative comparative study"**
Under review *Nurse Education Today*.
Impact factor 2,5. According to the Journal Citation Report (JCR) 2016.
Quartile 1: Nursing

1. ARTICLE 1

"Analysis instruments for the performance of Advanced Practice Nursing"

Published in *Enfermería Clínica*. 2017.

Impact factor 0,245. According to SCImago Journal Rank (SJR) 2017.

Enfermería Clínica

ELSEVIER

SPECIAL ARTICLE

Analysis instruments for the performance of Advanced Practice Nursing[☆]

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Abstract Advanced Practice Nursing has been a reality in the international context for several decades and recently new nursing profiles have been developed in Spain as well that follow this model. The consolidation of these advanced practice roles has also led to of the creation of tools that attempt to define and evaluate their functions. This study aims to identify and explore the existing instruments that enable the domains of Advanced Practice Nursing to be defined. A review of existing international questionnaires and instruments was undertaken, including an analysis of the design process, the domains/dimensions defined, the main results and an exploration of clinimetric properties. Seven studies were analysed but not all proved to be valid, stable or reliable tools. One included tool was able to differentiate between the functions of the general nurse and the advanced practice nurse by the level of activities undertaken within the five domains described. These tools are necessary to evaluate the scope of advanced practice in new nursing roles that correspond to other international models of competencies and practice domains.
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Instrumentos de análisis para el desempeño de la Enfermera de Práctica Avanzada

Resumen La Enfermería de Práctica Avanzada es una realidad en el contexto internacional desde hace ya varias décadas y, en los últimos años, también en España se están desarrollando nuevos perfiles que siguen este modelo. La consolidación de estos roles avanzados también ha propiciado la aparición de herramientas que intentan definir y evaluar sus funciones. Este estudio tiene como objetivo identificar y explorar los instrumentos existentes que permitan definir los dominios de la Enfermería de Práctica Avanzada. Se ha realizado una revisión de los cuestionarios e instrumentos existentes a nivel internacional, incluyendo un análisis del pro- ceso de diseño, los dominios/dimensiones definidas, los principales resultados y la exploración

de propiedades clinimétricas. Se han analizado 7 estudios, aunque no todos demostraron ser herramientas válidas, estables o fiables. Un instrumento incluido fue capaz de diferenciar entre las funciones de la enfermera de cuidados generales y la de práctica avanzada por el nivel de las actividades emprendidas en los 5 dominios descritos. Estas herramientas son necesarias para evaluar el alcance de los nuevos roles de la práctica avanzada en Enfermería que corresponden con otros modelos internacionales de competencias y dominios de práctica.

Introduction

Scientific-healthcare development and socio-demographic changes in the population require changes in nursing practice to increase excellence and evidence-based care in a sustainable manner. Many countries began to develop the role of advanced practice nursing (APN) at the end of the 20th century, when they arose as the result of the need to contain costs, improve access to care, reduce waiting time, offer a response to the most vulnerable people and maintain health among specific groups.[1] The role of APN covers common functions which generally characterise these profiles. The International Council of Nurses defines the advanced practice nurse as ''a graduate nurse with expert knowledge, skills in complex decision making and the necessary clinical competence for advanced practice, with a master/doctorate level of training.[2]'' In the last decade, the role of the APN has become a generalised trend and led to great national and international interest[3,4] in uniting criteria and obtaining consensus on the competence framework and the definition of characteristics under a globalising and unique concept. Although consensus exists regarding ANP knowledge and skills in practice, the concept implies a great variability of nursing profiles, with different competences, defined by the model *Strong*[5] or the model of Hamric et al.[6] They are accepted within the nursing profession, where the main difference in the professional profile between the APN and general care nurses is the APN's ability to accept more complex cases and manage them with greater independent, judgement and responsibility.

Academic and professional development in Spain

In Spain, university level training for nurses has undergone a major transformation during recent years, from being at university diploma level to becoming a university training on all academic levels of graduate, master and doctorate.[7] Professionally, notable advances have also been made, among which the development of specialist nurses stands out,[8] and implies the existence of two categories of professionals in our country: general care nurses and specialist nurses.[9] Several autonomous communities have also created professional degree systems and legal standards have also appeared which cover the exercise of new skills in the prescription of medication and healthcare products,[10] in

addition to the Royal Decree which regulates the advanced accreditation diplomas[11] under the heading of continuous professional training.

In recent years there has also been a notable increase in the number of studies on advanced practice in our environment. National studies assess different initiatives such as case management,[12] emergency nursing consultation for minor conditions in primary care,[13] advanced clinical nursing in the Basque Country,[14] and manuals which include the requirements for professional accreditation, such as the oncological APN in Andalusia.[15] A national study also exists on consensus of APN competence[16] or studies on the need for introduction of these profiles justified by accessibility and continuity of health attention in chronic diseases.[17] Similarly, just as there are nursing specialties and other profiles described in the literature, we also find innovative profiles in nursing which offer a portfolio of expert services, specific to the area of healthcare. These nursing profiles develop competent practice of greater complexity and autonomy in performing their tasks than a general care nurse. In general these nursing profiles are distinguishable because they offer a different portfolio of services and they are usually integrated into professional career models or into assessment of performance in their institutions and they could coincide with the description of advanced practice activities on an international level.

Definition of roles and profiles

The definition of the range of activities of advanced practice is essential for its implementation, development and sustainability long term.[18] Internationally, the implementation of new roles of advanced practice has been slow and heterogeneous due to its complexity. Despite the important contribution and benefits which these nurses offer to health services, greater comprehension of functions and activities exercised is needed. To do this tools need to be identified which help to define the range of activities inherent in the existing APN. The aim of this study is to identify and explore the instruments designed to analyse APN competence through the analysis of the activities and functions defined in countries where this role has already been fully established. It also suggests the need to assess the advanced practices in our environment of existing nursing profiles or emerging nursing profiles in Spain which may or may not

coincide with the activities described and defined in other countries.

Description and analysis of the tools

After analysing the main national and international data bases in Health Sciences and the consensus documents designed by the main professional organisms and collectives, 7 studies were selected for data extraction and exploration: Brady and Neal,[19] Willens et al., [20] Mick and Ackerman,[21] Brown and Waybrant,[22] Chang et al.[23,24] and Fry et al.[25]. Table 1 summarises the main characteristics of each instrument.

Brady and Neal[19] carried out a descriptive exploratory study aimed at identifying the responsibilities and functions of the APN in paediatrics. To do this they designed a questionnaire based on the conceptual model of the National Association of American Paediatric Nurses and the National Organisation of Nurse Practitioner Faculties of the United States. The tool was a questionnaire with socio-demographic variables and a Likert type scale divided into 3 sections, which contained work activities (175 items), specific clinical problem management (303 items) and professional role responsibilities (21 items). Apparent validity was initially assessed by a panel of 8 experts and later through a pilot study of 30 participants with a response rate of 67%. The final instrument was distributed to a random sample of 994 participants, out of whom a total of 337 responses were obtained. The study assessed the frequency and importance of each item and the scale in general. Mean scores for each of the dominions were analysed with demographic variables of the study population, years of experience, working environment, geographical region, prescriptive authority and practice sub-specialities, thus determining the functions and responsibilities of the sample within the study context.

In their study, Willens et al.[20] conducted an analysis of the job for the American Society of Pain Management Nursing. The study comprised 3 phases in which 6 dominions of performance were developed for APN performance in pain management. The instrument included 70 activities or items divided into 6 practice areas: (1) assessment, follow-up and pain assessment; (2) pharmacological pain management; (3) non-pharmacological pain management; (4) therapeutic communication and consultancy; (5) education of the patient and family, and (6) collaboration and organisation activities. The apparent content of the study was assessed using an independent panel of experts and a pilot study. A descriptive, exploratory study was conducted, which obtained a final sample of 585 certified advanced practice nurses in pain management. Results were sufficient to validate the performance domains identified by a panel of experts. An internal consistence measurement was used (Cronback alpha) using the classifications of consequence, frequency and participant performance. Frequency reliability was 0.97 and performance expectation was 0.95 in the described tool.

The study proposal of Mick and Ackerman[21] was to differentiate between the specialist nursing and advanced practice in critical care nursing roles. They conducted a descriptive study to this end which obtained 18 valid responses. The authors adapted the ''Strong'' model of

advanced practice to develop the descriptors of the advanced practice functions in critical care and designed an instruments validated by experts to differentiate between the two clinical practice roles. The instrument classifies individual knowledge using a visual analogue scale which ranges between 1and 10 (from apprentice to expert) in 5 practice domains: direct comprehensive care, support to systems, education, research and publication and professional leadership. The 42 activities described in each of the domains were measured using self-assessment of the experience in the practice domains and evaluation of the tasks relating to the role on a Likert type scale, where 1 was ''unimportant'' and 4 ''very important''. The function marking instrument describes the components of the APN role in daily practice.

Brown and Waybrant[22] also carried out a descriptive, exploratory study, which analyses the practice components of the nurse practitioners. A convenience sample of 146 nurse practitioners trained in the specific master course of the Pacific Northwest University. The instrument included demographic data, an inventory of coordination activities and an inventory of activities related to health promotion. The instrument designed comprises 27 items distributed into 3 practice domains: health promotion, education to the patient and counselling, which assesses the time dedicated to each domain using a Likert type scale. Content validity and appearance was made, as with previous studies, through a panel of experts and a pilot study. The instrument obtained a score of 0.90 in the Cronbach alpha coefficient for the inventory of coordination activities, similarly to the inventory of health promotion activities.

Chang et al.[23,24] established a group of experts to revise the activities of advanced practice of the tool created by Mick and Ackerman[21] using the Delphi technique with a panel of experts. During the study 5 activities were modified and consensus was obtained for the validation of the content of the modified tool. The main changes in the instruments were the elimination of an activity and the designing of another 5 activities. In a second publication[24] the authors established the validity of constructing the tool using an exploratory factorial analysis (EFA), and in a third publication Gardner et al.[26,27] assessed the internal validity of the same tool. In the study the statistical potential for EFA was low and obtained an item ratio of 16:1, indicating a precision level of between 60% and 70%. The construction validity of the tool was proven with their own values higher than 1, which represent 70% of the total variance. Five elements were named in accordance with the 5 domains of advanced practice of the original instrument and multiple lineal regression analysis was carried out where the factors which influence the advance practice nursing were examined in each of the domains described in the tool. The global validity rate of the questionnaire was also established derived from the percentage of answers using an applied Likert scale which measures the time each nurse dedicates to each of the domains. The percentages in accordance with the described domains were of between 100% and 87.5%. The EFA of the 5 practice domains ranged between the coefficients of 0.83 and 0.95, whilst the general Cronbach alpha coefficient of the tool was 0.94. The results of the tool allowed advance practice activities to be measured and

Table 1 Summary of the studies included.

	Brown and Waybrant, 1987	Brady and Neal, 2000	Mick and Ackerman, 2000	Willens et al., 2010	Chang et al., 2010	Fry et al., 2013
Conceptual model	Conceptual model of the National Organisation of Nurse Practitioners Faculties (U.S.A):	Conceptual model of the National Association of Paediatric Nurses and the National Organisation of Nurse Practitioners Faculties (U.S.A.)	Strong Model of Advanced Practice (U.S.A.)	American Nurses Credentialing Centre (ANCC) Pain Management (U.S.A.)	Modified-Strong Model of Advanced Practice (Australia)	New South Wales Health Department guidelines (Australia)
Population	Nurse practitioners graduated to master level from the Pacific Northwest University	Paediatric nurse practitioners	Specialist nurses (clinical nurse specialists) and advanced practice nurses in critical care (Advanced Nurse Practitioners)	Nurses specialised in pain management	Nurses and midwives randomly selected from a national database	Consultant nurses
Method	Anonymous Questionnaire via post which includes: (a) demographic data; (b) Coordination activities inventory, and (c) Health promotion inventory	Anonymous Questionnaire via post	Anonymous Questionnaire via post which includes: self-assessment instrument of APN role definition	Anonymous Questionnaire via email and post	State survey via post with 3 sections: (a) demographic data; (b) IDRAPN[a] modified, and (c) time dedicated to general practice domains	Review of the literature, on-line questionnaire and description of existing job functions
Variables	Time dedicated to each activity	Years of experience, working environment, geographical region, advocate authority and sub-speciality of practice	Self-assessment of the experience in practice domains and assessment of the practice domains and assessment of tasks relating to the role	Pain management activities related to the consequences, frequencies and expectations of the performance of activities	Frequency of advanced practice activities in keeping with nursing level	Characteristics and responsibilities of an advanced practice role - consultant nursing
Clinical impact	Scale permitting the exploration of the component of the nursing practice (nurse practitioners)	Process to assess several items passed from data of activity in primary care, level or responsibilities and type of pathologies managed by paediatric nurses	Scale permitting the differentiation of 2 specialist nurse roles (clinical nurse specialists) and nursing practitioner in critical care	Scale permitting the measurement of the specific activities and responsibilities of nurses specialising in pain management	It is possible to measure advanced practice activities which enable the differentiation between practice and advanced nursing practice	Can be used to measure the scope and responsibilities of the role of the consultant nurse. Does not determine the individual skill or differentiate between specialities

[a] Instrument defining the role of the advanced practice nursing.

to differentiate between general care nurses and the APN included in the study.

Lastly, the objective of the study carried out by Fry et al.[25] was to measure the performance of the consultant nurses, on the specific APN level, in Australia, in relation to the practice domains. The authors used existing literature, an on-line survey and professional degree descriptions to generate the practice domains. They conducted semi-structured interviews and a pilot study to test out the validity of the tool. The tool was designed with 50 items assigned to 5 practice domains with a hierarchical scale of 10 points within each domain. 56 consultant nurses participated in the study and the characteristics and responsibilities of these nurses in relation to the clinical service and consultancy, leadership, research, education and management and planning of clinical services with respect to their professional level were analysed.

Discussion

It is important to analyse in depth each of the chosen questionnaires and instruments included in the validity and reliability tests (Table 2). There are common characteristics[2] to the advanced practice nurse's role although each professional profile, work post and location have their singularities. The studies included in this review demonstrate the interest in creating instruments which are capable of analysing the APN domains in highly specific settings. Only Chang et al.[23,24] and Fry et al.[25] included different specialities aimed at analysing common practices and being able to differentiate the role of advanced practice of general care.

The same level of evidence[25] is appreciated among the main characteristics of the 7 studies analysed, with the exception of Fry et al.[25] that uses the synthesis of qualitative data. As may be observed, 2 of the studies included are designed as pilot studies, which may have the possibility of making inexact predictions and informing of imprecise results on initially obtained data bases. The characteristics of the population in each of the studies are convenience and specific in the context in which they are designed. Different profiles were included in the studies, as for example: nurse practitioners,[21] paediatric nurses,[18] specialist nurses in pain managment[19] or intensive care nurses.[19] Two studies included APN of different clinical areas[23,24] and one instruments was designed to include advanced practice roles regardless of the speciality, job function or professional level.[23] In this study different nurses from different sectors participated (primary, tertiary and intensive) with different professional categories. The definition of intervention in each one of the studies was made using anonymous questionnaires with similar objectives, intended to study the frequency, time, experience, characteristics of the activities and the APN domains. The majority of them were based on clinical guides established by professional associations or the corresponding health department, except for 2 studies which were based on the Strong Model of Advanced Practice[5] conceptual model. Mick and Ackerman[21] and Chang et al.[23] stated the combination of domains and activities described in the instruments in relation to the skills and domains of advanced practice described in the literature.[5,6]

With regard to clinimetric properties all scales analysed the properties of the instruments with multiple items. Using the panel of experts or semi-structured interviews the studies made it possible to obtain a judgement on the values of the content validity of each instrument. All the studies tried to establish the content validity of the instruments studied, 5 analysed the validity of appearance,[18,19,21,23,24] one the construct validity,[21] 3 the validity of criteria[19,21,22] and 3 analysed the reliability[18,21,23] of the instruments. With the exception of the Chang et al.[23] and the Gardner et al.[26] study, the other studies referred to expert consensus in the design of the tools although they did not report on the validity rates or the instrument construct validity.[5,6] The lack of references to these indexes minimises the evidence of assessment of each domain and the association with other validated measurements of the same construction in the instruments included. In Fry et al.,[25] A review of the previous literature was made and semi-structured interviews were conducted, in contrast with Chang et al.,[22] where the content of the instruments on the domains and activities of the APN was validated through a Delphi study.

The validity of appearance was also established in the majority of instruments through a pilot study after the panel of experts. Willens et al.[20] assessed the action of each of the described domains and activities. This established the capacity of the instrument to carry out the tasks for which it was designed and proved the specific use of the questionnaire for the study aim put forward. The values of frequency, consequences and expectations of tasks between the participants established the validity criteria of the questionnaire for the specialist nurses in pain management The study by Chang et al.[22] was the only one to carry out an EFA to establish the construct validity of the instrument. In this sense, and given the difference between countries, sometimes difficulties occurred in the contextualisation and interpretation of results, particularly when they mentioned performance in the different areas of clinical specialisation, where depending on the country, there could be general, specialist or APN nurses. First, through a Delphi study, the authors developed an instrument for the APN definition, in which a consensus of informed opinions were obtained. The percentages of agreement in the different Delphi rounds confirmed that the instrument could be useful in reducing the confusion which existed on the definition of the APN role.

With regard to internal reliability and consistency of the questionnaires included, 3 studies calculated Cronbach's alpha coefficient as above 0.90, which reflects the level in which the elements in the scales are associated to one another. These studies are those of Brown and Waybrant,[22] Willens et al.[20] and Chang et al.[22] The stability test-retest of the instruments was not determined in the studies included, and no reference was made to the absence of errors of measurement, or what is the same, the stability of the scores of an instrument over time.

The findings from the Chang et al.[23] study are the only ones to show the different activities carried out by the APN and prove major statistical differences in accordance with the professional level and score of the total activities in all APN environments. The differences between the different practice domains of nurses who exercise advanced practice and those who do not, mean that differentiation made be

Table 2   Analysis of the clinimetric results and properties of the instruments.

	Brown and Waybrant, 1987	Brady and Neal, 2000	Mick and Ackerman, 2000	Willens et al., 2010	Chang et al., 2010	Fry et al., 2013
Number of items	27	499	42	70	41	50
Domains	(1) Health promotion (2) Patient education (3) Counselling	(1) Activities focused on health care (2) Specific clinical problems (3) Professional responsibilities	(1) Direct integral care (2) Interprofessional support systems (3) Education (4) Research (5) Publications and professional leadership	(1) Assessment, monitoring and pain assessment (2) Pharmacological pain management (3) Non pharmacological pain management (4) Therapeutic communication and counselling (5) Education to the patient and family members (6) Collaborative and organisational activities	(1) Direct comprehensive care (2) Interprofessional support systems (3) Education (4) Research (5) Publications and professional leadership	(1) Clinical service and consultancy (2) Leadership (3) Research (4) Education (5) Management and planning of clinical services
Content validity	Expert panel and pilot test	Expert panel	Expert panel	Expert panel and pilot test	Expert panel Global index of 0.75 or above	Semi-structured interviews and pilot test
Appearance validity	Expert panel and pilot test	Expert panel and pilot test	–	Expert panel and pilot test	Expert Panel and pilot test	Semi-structured interviews and pilot test
Construct validity	–	–	–	–	EFA 5 elements with loads of ≥400 of 40 of the 41 activities of advanced practice which were similar to the 5 domains of advanced practice described Precision level of 60–70%	–

Table 2 (*Continued*)

	Brown and Waybrant, Brady and Neal, 2000	Mick and Ackerman, 2000	Willens et al., 2010	Chang et al., 2010	Fry et al., 2013
Validity of criteria	–	–	Assessment of action of each of the domains and activities (frequency, consequence and expectations of activities)	Yes	Assessment of action of each of the domains and level of nursing (professional level)
Reliability-internal consistency	Cronbach's alpha coefficient of 0.90 for the coordination activities inventory scale Cronbach's alpha coefficient of 0.90 for the Health promotion inventory	–	Cronbach's alpha coefficient of 0.95 in the performance expectation Cronbach's alpha coefficient of 0.97 in the frequency of scale Cronbach's alpha coefficient of 0.99 in the assessment of consequences	Cronbach's alpha coefficient of 0.94 for the 5 elements found in the EFA ranged from 0.83 to 0.95	–
Reliability-temporary stability/test–retest	–	–	–	–	–

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made between the different levels of professional practice and allows us to define and differentiate the role of the APN from the role of the general care nurses within an international framework using a valid and reliable questionnaire.

To sum up, all the instruments included have their own limitations both in the development of studies and in the interpretation of results to establish validity and reliability. The most extensive instruments by Brady and Neal[19] and Willens et al.,[20] which comprise between 499 and 70 items, respectively, could be a limitation when applying them in practice. Furthermore, 4[19–21] of the studies include was designed for a specific sample of the APN population, and results may not be generalised. The specific activities of the APN in paediatrics, pain, nurse practitioners and critical care are not possible to translate into the activities and general domains of the APN in keeping with the studies described. Fry et al.[25] included consultancy nurses in a tertiary level hospital, and although this study assesses the domains of practice of different specialities it remains specific at a certain level in the study context. None of the studies included established temporary stability.

Conclusions

The set of function domains inherent to APN and their complexity as described in the questionnaires included in this paper are consistent with other international competency models and advance practice domains. This study describes the validity of content of the tools included; however, not all proved to be valid, reliable or to have temporal stability. We identified only one instrument as capable of differentiating advanced practice activities from general nursing care activities. There is an ever-increasing need, both nationally and internationally, to distinguish advanced practice roles from general care roles. Therefore using questionnaires to analyse the activities currently undertaken in our setting could contribute to the definition and analysis of APN functions. While various APN profiles and some advanced practice roles have been defined, such as nurse prescribing to cover the needs of the current health system, APN has not yet been fully developed or legally recognised in Spain. There is a need for reliable instruments, based on those currently available and adapted to our context, to provide greater clarity on the role of APN and to contribute to its correct implementation, development and sustainability within the health system.

Conflict of interests

The authors have no conflict of interests to declare.

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2. ARTICLE 2

"Spanish version of the Modified Advanced Practice Role Delineation tool, adaptation and psychometric properties"

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RESEARCH METHODOLOGY PAPER

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Spanish version of the modified Advanced Practice Role Delineation tool, adaptation and psychometric properties

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Abstract

Background: Role clarity is vital to avoid confusion and role ambiguity within nursing. There is a need for valid, reliable tools that can delineate the profile of advanced nursing practice to measure the extent of advanced practices in Spain.

Aim: The main purpose of this study was to translate, cross-culturally adapt, and psychometrically test the Spanish version of the modified Advanced Practice Role Delineation tool.

Design: The study was designed to follow symmetrical translation and cognitive debriefing to determine conceptual equivalence. A cross-sectional survey was conducted to examine content validity and psychometric tests.

Methods: Data were collected over 6 months in 2015 and 2016. The study had a purposive sample of specialist nurses and nurses with an extended practice profile beyond that of a general nurse.

Results: The study achieved conceptual, semantic, and content equivalence of the items. The results provided support for the instrument's validity and reliability in advanced practice nursing in a tertiary and community hospital. The tool showed internal consistency, with a Cronbach's alpha coefficient of 0.86 and stability over time.

Conclusion: The findings should influence future nursing practice, research, and leadership while allowing assessment of Spanish advanced practice roles in an international context.

KEYWORDS

advanced practice, nursing, psychometrics, questionnaire design, standard of care, surveys and questionnaires

SUMMARY STATEMENT

What is already known about this topic?

- Professional nursing practice has been expanded to adapt to new health and social requirements.

- Internationally, there are instruments that describe and measure specific nursing activities and domains covered by advanced practice nurses. The modified Advanced Practice Role Delineation tool has been shown to be a valid, reliable instrument for predicting the extent of advanced practices across different organizations in contemporary society.

- At a time when advanced practice nursing roles are emerging in Spain, clarification of roles and delineation of functions is required using well-adapted, precise tools to avoid confusion and role ambiguity.

What this paper adds?

- Results of this study support the adaptation, validity, and reliability of the Spanish version of the modified Advanced Practice Role Delineation tool.

- Results confirm the reliability of the tool, which was estimated through internal consistency and test-retest stability. The tool showed evidence of acceptable psychometric properties for use in a nursing and midwifery population in the Spanish context.

- The results provide a framework for delineating and measuring the extent of advanced nursing domains and activities in the study context.

The implications of this paper:

- The findings should be used to explore and develop emerging advanced nursing practices in Spain. The tool will be useful to measure the extent of advanced nursing practice and activities within the study population and to influence role delineation.

- The tool could help to overcome role ambiguity and false expectations that could benefit future practice, professional development, and policy regarding advanced nursing practice.

- It will also allow comparison of advanced practice roles with those in other international contexts.

1 | INTRODUCTION

The development and transformation of nursing roles such as advanced practice nursing (APN) have grown considerably over the years to adapt to complex health care organizations and population needs. The expansion of the nursing field of practice is viewed as a way to better respond to changes in society and shifting health needs (Bodenheimer & Smith, 2013). However, innovative APN roles have seen slow, sporadic implementation across borders and their activities and functions diverge among countries, and areas within countries. The International Council of Nurses (ICN) defines the APN as a registered nurse with expert knowledge, complex decision-making skills, and the clinical competencies necessary for expanded practice (ICN, 2009). This definition is broad and requires a context overview to fully describe specific professional profiles. The main difference between APNs and registered general nurses is APNs' capacity to take on more complex caseloads and manage them with greater independence, judgement, and accountability. There is a need to measure these differences and the way expanded practice is implemented from place to place. Relevant validated tools that measure domains and activities in APN support (the need for) practice, education, and research to examine the extent of nursing practice accurately and to have a deeper understanding of the care provided. Understanding APN performance in a specific context could allow comparison, identify dissimilarities with respect to other roles internationally, and support health care organizations that have long struggled with the question of how to implement and develop APN roles (Andregård & Jangland, 2015; Sangster-Gormley, Martin-Misener, Downe-Wamboldt, & DiCenso, 2011).

This study was conducted as a necessary step in describing current standards of practice, extent of advanced nursing practice, and role delineation. Internationally, it is important to identify essential APN activities, knowledge, and/or the skills required to be a competent professional and to describe variations within different care contexts. A large number of studies have attempted to examine APN

characteristics (Donald *et al.*, 2010; Jokiniemi, 2012; Sastre-Fullana *et al.*, 2015) and to understand the relevant activities and expanded functions. Gathering data to describe changes in nursing practice accurately is a necessary step in avoiding role ambiguity and defining the domains of practice and their associated activities (Liego, Loomis, Van Leuven, & Dragoo, 2014).

However, no studies or instruments have been found in the Spanish language that could describe or measure the extent of current advanced nursing practice and/or domains in the study context. This paper presents the findings of the translation, adaptation, and psychometric testing of the Spanish version of the modified Advanced Practice Role Delineation (APRD) tool (Chang, Gardener, Duffield, & Ramis, 2010).

2 | BACKGROUND

Nursing regulations in Spain identify the existence of 2 professional categories: general and specialist nursing. In the last decade, general nurses have gained access to master's degrees, nursing specialties, and doctoral studies (Zabalegui & Cabrera, 2009). The government has developed 2-year residency programmes in the clinical area for the nursing specialties of obstetric-gynaecological nursing/midwifery, mental health nursing, occupational health nursing, geriatric nursing, family and community nursing, and paediatric nursing. Furthermore, the advance in nursing-education programmes and professional practice has allowed the unofficial introduction of pioneering roles in clinical practice that have an expanded level of practice and meet higher expectations within their service portfolio than a registered nurse. In general, these nurses have higher educational qualifications, such as a master's degree, or an academic specialty, such as midwifery, mental health, or community practice. However, despite the professional and academic development, with the exception of midwives, nurse specialists and developing APN roles do not have established positions in clinical practice. New roles have not been regulated, and their activities and functions are poorly understood in practice.

The APRD tool was originally developed by Mick and Ackerman (2000) and aimed to describe intensive care acute practitioners based on the strong model for APN (Ackerman, Norsen, Martin, Wiedrich, & Kitzman, 1996). The conceptual strong model for APN identifies 5 domains: (1) direct comprehensive care, (2) support of systems, (3) education, (4) research, and (5) publication and professional leadership. The model presents a framework for delineation of job functions through analysis of practice activities. The instrument was then modified by Chang et al. (2010) with the aim of validating an instrument to measure APN role function in an international contemporary health care system. The modified APRD tool comprised 41 items across the 5 practice domains described by the strong model.

Advanced practice nursing domains and activities are described and quantified in the literature. Seven studies were identified that reported on instruments or questionnaires that could help assess the role of the advanced practice nurse or measure their activities and that had sufficient statistical data to determine the validity, reliability, and stability of these instruments. Most of the studies focused on specific

areas of work such as paediatrics (Brady & Neal, 2000) or pain management (Willens, DePascale, & Penny, 2010), or particular nursing roles such as nurse practitioners (Brown & Waybrant, 1987), clinical nurse specialists (Lindeke, Canedy, & Kay, 1997), intensive care acute practitioners (Ackerman et al., 1996), or consultant nurses (Fry et al., 2013). Two of the included studies were pilot studies, which may report inaccurate results and predictions based on the pilot data obtained. None of them reported on construct validity or test-retest stability. Some did not measure reliability (Brady & Neal, 2000; Mick & Ackerman, 2000).

The content of the modified APRD tool was confirmed through a Delphi study followed by an exploratory factor analysis (EFA; Chang, Gardner, Duffield, & Ramis, 2011) with results showing 5 factors with eigenvalues above 1: accounting for 70% of the total variance. Reliability of the tool was supported with a Cronbach's alpha coefficient of 0.94, and the internal validity was established in a further complementary study (Gardner, Chang, Duffield, & Doubrovsky, 2012). The study verified that the instrument can differentiate between general registered nurse/midwife roles at lower professional career grades and advanced practice nurse roles by the number of APN activities undertaken independently of the area of practice.

3 | METHODS

3.1 | Aim

The purpose of this study was to translate, adapt, and test the psychometric properties of the Spanish version of the modified APRD tool with Spanish health care nurses. The specific objectives were

- to obtain a Spanish translation and conceptual equivalence of the modified APRD tool
- to examine the validity and reliability of the Spanish version of the modified APRD tool for use in Spanish cross-cultural health care research.

3.2 | Study design

A psychometric study with a cross-sectional online design was conducted. Psychometrics are concerned with the construction and validation of assessment instruments and the statistical research bearing on measurement theory. Specific key concepts in study methodology are reliability and validity. Reliability refers to construct consistency across time, participants, and context. It is usually measured by the extent to which the scale items correlate (internal consistency), and the association between items at 2 time points (test-retest stability). A valid measure is one that measures what it aims to measure and is usually determined by content, construct, and criterion. Both reliability and validity are usually measured statistically. This study follows the recommendations for reporting and testing of instruments and scale development (Streiner & Kottner, 2014) and incorporated user-friendly guidelines (Sousa & Rojjanasrirat, 2011) to facilitate adoption, consistency, and use of recommendations.

3.3 | Setting and sample

Study participants were all specialist nurses and nurses with a more advanced competency profile than a general nurse in Spain. The study had a purposive sample of 151 nurses employed by a dual tertiary and community hospital in Barcelona, Spain. Regardless of job position, all specialist nurses who had completed specialist nursing training and/or nurses with an expanded level of practice that exceeded the service portfolio of a general nurse were identified and included in the study. General nurses providing standard care, nurses in managerial posts with no direct patient-contact were excluded from this study.

To further determine sample characteristics and level of expertise, hospital data on hospital career ladder grades and job positions were collected. Sample size was determined by including all possible expert and specialist nurses working in the study context. Data were collected in 2015 and 2016.

3.4 | Ethical considerations

Ethics committee approval was obtained from the relevant hospital (Exp #HCB/2014/0811). Participants were asked whether they would agree to participate in the study prior to completing the questionnaires. Nurses agreeing to participate were assured of the anonymity of their responses in the findings report and research analysis.

3.5 | Data collection/instrument

The tool had 2 distinct parts, one to collect demographic data and a second part with the translated and adapted instrument. Demographic information was introduced into the instrument regarding age, job position, years of experience, current nursing grade (own hospital career ladder), and highest educational level.

The original modified APRD tool is a paper-based, self-administered tool that asks participants to indicate the extent of time that they would spend in their current position on each listed activity. It has 41 items across the 5 practice domains described above. It uses a 5-point Likert scale from 0 to 4 where 4 = to a very great extent, 3 = to a great extent, 2 = to some extent; 1 = to a little extent, 0 = not at all. Scores ranged from 0 to 164 and APNs scored higher than general nurses. The second part of the instrument contained the translated and adapted questionnaire, which was designed to be completed online to facilitate participation. Responses were required to all questions to minimize missing data. A link to the online instrument was sent by email to the purposive sample. Permission to use the modified APRD tool was obtained from the original authors (Mick & Ackerman, 2000) and from the authors of the modified version (Chang et al., 2011).

3.6 | Translation processes

The translation process was thorough and followed the symmetrical category of translation and back-translation method (Sousa & Rojjanasrirat, 2011) to facilitate comparison of responses from individuals of one culture with those of another (Souza, Zauszniewski, Mendes, & Zanetti, 2005) with respect to semantics, content, concept, technical issues, and criterion. The study used a process known as

centring (Regmi, Naidoo, & Pilkingto, 2010) in which both the instrument's source language and the target language are equally important. The original tool in the source language was translated from English by 2 independent bilingual translators whose mother language was Spanish. The translators were from different cultural backgrounds with lifelong knowledge of Spanish culture. The 2 translated versions, with their cultural nuances were compared by a third bilingual independent translator to synthesize and check for discrepancies between words, sentences, and meanings. Any ambiguities and discrepancies were resolved by consensus of all 3 independent translators and the study authors. The initial translation was then translated back into the source language by 2 further independent translators with similar characteristics to those conducting the forward translation, who were completely blind to the original instrument and had no prior knowledge of the tool being back-translated. Both back-translations were compared by a committee with the instructions, items, and response format of the original instrument to check for similarity in meaning and relevance and to allow clarification of format, words, and sentences used. Discrepancies were found between the original English version of the modified APRD tool and its Spanish translation. The differences were identified on translating the domain headings "direct comprehensive care" and "support of systems." There were also differences with some wording and 2 of the items. In all cases, one of the translators appeared to provide more than a literal translation of the item while the other expanded on the item's interpretation, illustrating the distinction between linguistic and conceptual equivalence of the wording.

3.7 | Psychometric testing and data analysis

To achieve conceptual, semantic, and content equivalence of the items, 5 criteria were examined: content, meaning, method of assessment, interpretation, and a committee approach to resolve all ambiguities and discrepancies. The committee evaluated, revised, and consolidated the instructions, items, and response format of the back-translated instrument to estimate its initial conceptual, semantic, and content equivalence.

Content validity was examined with a sample of 39 monolingual participants from the target population in pilot testing the penultimate version of the instrument in the target language (Souza, Hartman, Miller, & Carroll, 2009) to evaluate instructions, items, and response format clarity in a limited sample size. Each of the participants in the pilot test was asked to complete the Spanish version of the modified APRD tool and to rate its instructions and items using a dichotomous scale (clear or unclear). Instructions, response format, and items that were found to be unclear by at least 20% of the sample were reevaluated by the committee members. An expert panel of 8 participants explored content appropriateness and relevance by using the Lynn method of content validity scale (Devon et al., 2007). Content equivalence or content-related validity using a content validity index at the item level (I-CVI) and at the scale level (S-CVI) was also computed to further examine the instrument (Arafat, Chowdhury, Qusar, & Hafez, 2016). The expert panel was asked to evaluate each item for content equivalence and relevance using the following scale: 1 = not relevant; 2 = unable to assess relevance; 3 = relevant but needs minor alteration; and 4 = very relevant and succinct. Items that were classified as 1 or 2 were revised (Anthoine, Moret, Regnault, Sébille, & Hardouin, 2014) and panel members were asked to offer suggestions to improve clarity. Figure 1 illustrates the translation, adaptation, and content validity process applied to the Spanish version of the modified APRD tool.

Construct validity was studied using EFA and confirmatory factor analysis (CFA). In EFA, a principal component analysis and varimax rotation with Kaiser normalization were performed to test the factor structure of the Spanish version of the modified APRD tool. The adequacy of data for factor analysis was examined using Bartlett's test
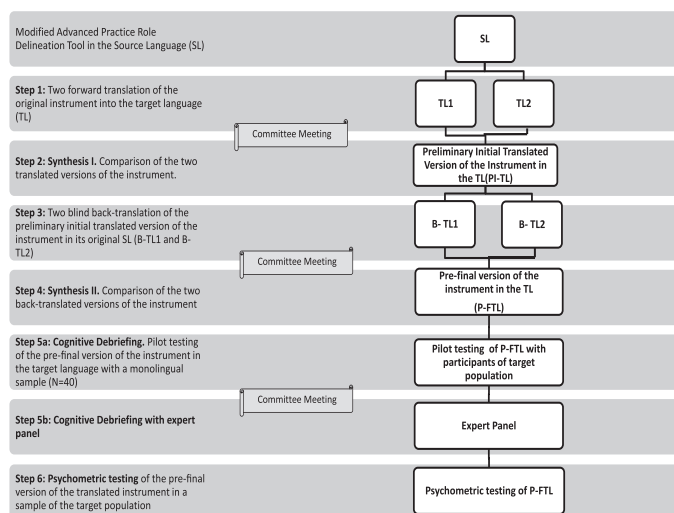

FIGURE 1 Translation, adaptation, and content validity process of the Spanish version of the APRD tool

of sphericity and the Kaiser-Meyer-Olkin (KMO) measure where a KMO value above 0.9 was considered excellent (Pett, Lackey, & Sullivan, 2003).

To determine the number of factors to retain, we considered the scree plot with eigenvalue >1, the Velicer minimum average partial criterion (Velicer, 1976), percentage of explained variance, and the interpretability of factors. A minimum factor loading of 0.4 was used as the criterion for each retained item and a difference of ≥0.2 between the primary loading and any secondary loading for an item; items without this difference were assigned to the named factors with the most theoretical sense (Stevens, 1992). On the basis of the results of EFA, CFA was used to establish the "best-fitting" model between the original 5-factor model and a proposed 6-factor model. Several criteria were used in determining the goodness of fit to the data including the normed chi-square, Tucker-Lewis index (TLI), comparative fit index (CFI), and standardized root-mean-square residual (SRMR). Chi-square value divided by the degrees of freedom (χ^2/df) was considered, with values under or near 3 indicating good model fit (Bollen, 1989). A cut-off value close to .95 for TLI and CFI and a cut-off value close to .08 for SRMR were considered as a good fit of the data to the model (Hu & Bentler, 1999). Spearman correlation coefficients were computed to determine intercorrelations between dimensions.

Internal consistency was examined using Cronbach's alpha, which was considered acceptable if the value was greater than 0.7 (Streiner & Norman, 2003). The time reliability of each item was tested through 2 similar assessments, made within 6 months of each other, using the intraclass correlation coefficient ($ICC_{2,1}$). The time between the first and second rounds of questionnaire completion was longer than recommended (Streiner & Norman, 2014) although the nurse-activity construct being assessed was a stable trait across assessments and no other mayor changes occurred within this time. All analyses were conducted using the R V.3.2.3 for Windows statistical software package.

4 | RESULTS

4.1 | Participants

The study had a response rate of 91.5% and was conducted in a setting that serves a dual mission as a community and highly specialized tertiary hospital with a total of 2076 permanent staff. A total of 165 specialists and advanced clinical nurses were identified as eligible to participate by the authors.

The characteristics of the participants are outlined in Table S1. All age groups were evenly represented in the study; those older than 60 years were the least represented group with 5.3% of the participants. The participants were in a range of different positions such as registered midwives (23.8%), registered clinical nurses (15.9%), outpatient nurses (15.2%), unit managers (7.9%), case managers (6.6%), emergency nurses (6.6%), nurse anaesthetists (6.6%), and others (17.4%). Most participants had 0 to 5 years of experience in the current role (67%). Some 35.8% of nurses held an educational qualification of a master's degree, the most common qualification, with 16.6% having obtained a nursing degree or equivalent only. Other participants held

complementary qualifications such as postgraduate degree, specialist nursing degree, and PhD. The 2 groups with most representatives in the hospital's own career ladder were level 4 (27.8%) and level 3 (23.8%) out of 5 possible levels where level 1 is the lowest level and level 5 is the maximum where a PhD is required. This means that most nurses at levels 3 and 4 were in the middle/upper tier of the organizational ladder in the context of study.

4.2 | Validity

The 39 pilot test participants rated the instructions, items, and response format by using a dichotomous scale (clear or unclear). Items 4.6 "collaborate with information specialists" and 5.5 "represent a professional nursing image" were found to have long sentences and statements that were difficult to follow and understand by at least 20% of the sample. These items were reevaluated. The I-CVI and S-CVI were calculated through the responses of the expert panel and completed by 8 expert raters. Some wording in the items was revised and reassessed until acceptable indices of content-related validity were achieved. Three items were found to be under the minimum acceptable I-CVI of 0.78, they were 2.6 "mentor," 2.7 "advocate," and 5.4 "represent nursing." No consensus was reached on these 3 items as they were found to be meaningless, repetitive, or culturally irrelevant in our context. It was then decided that these items should be excluded from the tool and domain headings should be rephrased. Post S-CVA was 0.95, which was above the minimum acceptable score for content validity of the tool in Spanish.

4.3 | Reliability

A final sample of 151 participants was used to test the construct-related validity, internal consistency, and test-retest stability of the newly adapted tool. Item category frequency responses are outlined in Table S2. The results of the KMO sampling adequacy measure (0.87) and Bartlett's test of sphericity (χ^2 = 3226.6, df = 703, P < .001) were adequate, indicating that a significant factor analysis model was present. Table 1 shows the factors retained in the instrument. Results of the scree plot are presented in Figure 2. The principal component analysis showed 8 factors with eigenvalues above 1. According to the Velicer minimum average partial criterion, the appropriate number of factors to retain in EFA was 6, which accounted for 65.8% of total variance. As shown in Table 1, all factor loadings are higher than .4. One of the factors from the original tool (comprehensive patient care) divided into 2 differentiated factors. The items in the new factor 1 were related to expert direct care and expert care planning while the items in the new factor 2 were associated with integrated patient care. After EFA, each of the rotated factors was labelled: domain 1, "expert care planning"; domain 2, "integrated care"; domain 3, "interprofessional collaboration"; domain 4, "education"; domain 5, "research and evidence-based practice"; and domain 6, "professional leadership." Furthermore, as shown in Table 2, items 2.1 "consult with others" and 4.4 "use research and theory" loaded on different factors from the original modified APRD tool although they were both assigned to their original domains to ensure conceptual sense. Items 1.2 "assess psychosocial factors," 1.15 "efficient movement of patient," 2.8 "spokesperson for nursing," 3.3

TABLE 1 Principal component analysis followed by varimax rotation (construct validity)

Item Number	Advanced Nursing Practice Domains					
	PC2	PC5	PC4	PC3	PC1	PC6
	Expert Care Planning	Integrated Care	Interprofessional Collaboration	Education	Research and Evidence-based Practice	Professional Leadership
Expert care planning						
1.1. Patient history	0.82					
1.2. Assess psychosocial factors	0.46	0.62				
1.3. Diagnostic tests	0.66					
1.4. Identify required diagnostic tests	0.86					
1.5. Interpret assessment data	0.77					
1.6. Speciality-specific care	0.68					
1.10. Documentation	0.65					
Integrated care						
1.7. Patient/family response		0.80				
1.8. Communicate plan		0.87				
1.9. Provide appropriate education (counselling)		0.87				
1.11. Consultant regarding patient care		0.46				
1.12. Ethical decision making		0.47				
1.13. Interdisciplinary plan		0.59				
1.14. Collaborate with other services		0.48				
1.15. Efficient movement of patient		*0.48*	*0.56*			
Interprofessional collaboration						
2.1. Consult with others				**0.69**		
2.2. Contribute, consult, collaborate			0.56			
2.3. Strategic planning			0.64			
2.4. Quality improvement			0.56			
2.5. Assessment, development, implementation and evaluation			0.60			
2.8. Spokesperson for nursing			*0.51*			*0.52*
Education						
3.1. Evaluate education programmes				0.49		
3.2. Educator and clinical preceptor				0.78		
3.3. Identify learning needs				0.43	0.45	
3.4. Informal educator to staff				0.56		
3.5. Professional development				0.64		
3.6. Patient and family education		0.57		*0.47*		
Research and evidence-based practice						
4.1. Clinical investigation					0.44	
4.2. Monitor and improve quality					0.60	
4.3. Identification of potential funding					0.67	
4.4. Use research and theory				**0.51**		
4.5. Identify clinical data for collation					0.80	
4.6. Collaborate with information specialists					0.77	
Professional leadership						
5.1. Disseminate nursing knowledge						0.62
5.2. Serve as a resource						0.74
5.3. Serve as a consultant						0.70
5.5. Represent a professional nursing image						0.68
5.6. Collaborate with other health care professionals						0.56

In bold, items corresponding to a different domain regarding the original version of the APRD. In italics, items assigned to the named factors with the most theoretical sense.
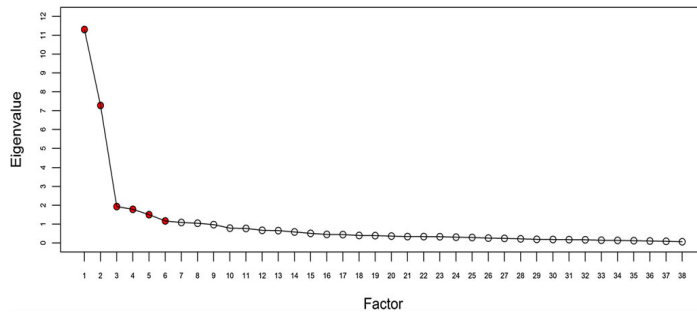
FIGURE 2 Scree plot

TABLE 2 Intercorrelation and internal consistency of Advanced Nursing Practice domains (reliability)

Domain	Domain						Mean (SD)	Cronbach's α
	Expert Care Planning	Integrated Care	Interprofessional Collaboration	Education	Research and Evidence-based Practice	Professional Leadership		
Expert care planning	1						2.79 (1.05)	0.92
Integrated care	0.646[a]	1					2.67 (1.00)	0.91
Interprofessional collaboration	0.020	0.298[a]	1				1.54 (0.93)	0.84
Education	0.368[a]	0.457[a]	0.599[a]	1			1.97 (0.98)	0.83
Research and evidence-based practice	0.178	0.361[a]	0.595[a]	0.522[a]	1		1.23 (0.93)	0.82
Professional leadership	−0.020	0.224[a]	0.682[a]	0.534[a]	0.640[a]	1	1.35 (1.03)	0.86

[a]Statistically significant Spearman correlation coefficients at 0.05 significance level.
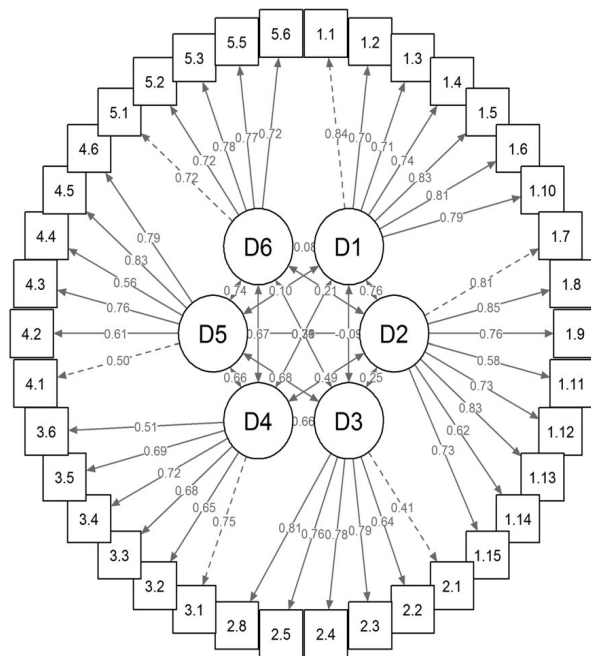
FIGURE 3 Results from the 6th-order confirmatory factor analysis of the modified APRD

"identify learning needs," and 3.6 "patient and family education" were assigned to the named domains with the most theoretical sense in the context of study. The results of the CFA suggested that both models were adequately fitted to the data, but the hypothesized 6-factor model had a better fit than the 5-factor model as shown in the path diagram in Figure 3 (χ^2/df = 1.97 vs 2.17; CFI = 0.79 vs 0.74; TLI = 0.77 vs 0.72; SRMR = 0.10 vs 0.12). The tool showed acceptable internal consistency with a Cronbach's alpha coefficient of 0.86 for the Spanish version of the modified AP role delineation tool and for each of the factors: expert care planning (α = 0.92), integrated care (α = 0.91), interprofessional collaboration (α = 0.84), education (α = 0.83), research and evidence-based practice (α = 0.82), and professional leadership (α = 0.86). As shown in Table 2, almost all dimensions had a moderate/high intercorrelation between them apart from expert care planning, which was unrelated to professional collaboration, research and evidence-based practice, and professional leadership. Test-retest stability was used to assess the reliability of the scores over time. Table 3 shows the intraclass correlation coefficients ($ICC_{2,1}$), which were considered at item level. The instrument was completed a second time by the participants (n = 123) within 6 months of the first completion. All items showed temporal stability ($P < .05$). The lowest coefficient was for item 2.1 although it was also statistically significant and the instrument showed good stability over time.

5 | DISCUSSION

This study represents the first attempt to examine the reliability and the validity of a Spanish version of the modified APRD tool (Chang et al., 2010). The results support the instrument's validity and reliability among APN in a dual tertiary and community hospital in Barcelona, Spain. Factor analysis on data from the sample population supports the construct validity of the Spanish version of the tool; the findings supported 6 APN factors/domains that were broadly similar to the original tool's 5 domains. The original domain, "direct comprehensive care," included activities related to care planning (patient history, documentation, diagnostic tests, assessment, etc) and activities related to holistic/integrated care (interdisciplinary plan, decision making, family response, and collaboration with other professionals) and were all included in a single domain. The segmentation of the original dimension "direct comprehensive care" into 2 new domains could indicate that participants may distinguish between clinical specialist practice and integrated care. As APN roles have not been implemented formally in the context of study, nurses that perform advanced practice could have difficulty integrating all activities as a single domain rather than 2 distinct sets of competencies: expert care planning and integrated care. How APNs enact their roles is highly variable in response to population health and practice setting needs, which may support these results. Results support the reliability of the tool as estimated by internal consistency and test-retest stability. The internal consistency estimate is consistent with findings from the original tool, which reported a Cronbach's alpha of 0.94 in a large nursing/midwife population in Australia (Chang et al., 2011) providing support for the domains and activities, which were remarkably similar to those in the

TABLE 3 Test-retest stability of advanced nursing practice domains (reliability)

Item number	$ICC_{2,1}$	P value[a]
Advanced care plan		
1.1. Patient history	0.746	<.001
1.2. Assess psychosocial factors	0.762	<.001
1.3. Diagnostic tests	0.658	<.001
1.4. Identify required diagnostic tests	0.729	<.001
1.5. Interpret assessment data	0.579	<.001
1.6. Speciality-specific care	0.714	<.001
1.10. Documentation	0.809	<.001
Integrated care		
1.7. Patient/family response	0.691	<.001
1.8. Communicate plan	0.806	<.001
1.9. Provide appropriate education (counselling)	0.790	<.001
1.11. Consultant regarding patient care	0.483	<.001
1.12. Ethical decision making	0.662	<.001
1.13. Interdisciplinary plan	0.659	<.001
1.14. Collaborate with other services	0.663	<.001
1.15. Efficient movement of patient	0.645	<.001
Interprofessional collaboration		
2.1. Consult with others	0.253	.002
2.2. Contribute, consult, collaborate	0.481	<.001
2.3. Strategic planning	0.653	<.001
2.4. Quality improvement	0.673	<.001
2.5. Assessment, development, implementation and evaluation	0.577	<.001
2.8. Spokesperson for nursing	0.417	<.001
Education		
3.1. Evaluate education programmes	0.489	<.001
3.2. Educator and clinical preceptor	0.438	<.001
3.3. Identify learning needs	0.451	<.001
3.4. Informal educator to staff	0.450	<.001
3.5. Professional development	0.428	<.001
3.6. Patient and family education	0.565	<.001
Research and evidence-based practice		
4.1. Clinical investigation	0.506	<.001
4.2. Monitor and improve quality	0.580	<.001
4.3. Identification of potential funding	0.562	<.001
4.4. Use research and theory	0.422	<.001
4.5. Identify clinical data for collation	0.518	<.001
4.6. Collaborate with information specialists	0.461	<.001
Professional leadership		
5.1. Disseminate nursing knowledge	0.508	<.001
5.2. Serve as a resource	0.609	<.001
5.3. Serve as a consultant	0.614	<.001
5.5. Represent a professional nursing image	0.617	<.001
5.6. Collaborate with other health care professionals	0.508	<.001

[a]A P value <.05 indicates time reliability between 2 similar assessments.

original (Mick & Ackerman, 2000) and modified tools (Chang et al., 2010). The corrected item-to-total correlations for all 38 final items exceeded the 0.3 criterion (Cronck, 2004), suggesting homogeneity of the measure and that each item was measuring a unique construct.

Furthermore, test-retest stability, measured through intraclass correlation, produced a stable score across time.

Researchers and clinicians must have access to reliable, valid measures of concepts of interest in their own cultures and languages to conduct cross-cultural research and be able to provide quality patient care. By translating, adapting, and cross-validating the Spanish version of the APRD tool, the study reduces bias through detection of cross-cultural ambiguities and misinterpretations, which can then be minimized. Hence, by using the newly adapted tool, better quality data could be collected in clinical practice that could facilitate improvements in international comparability and quality of information.

5.1 | Limitations

The study had some limitations. While there is a wide variation in the recommendations for determining sample size, in general, the rule of thumb is approximately 300 to 500 subjects (Tabachnick & Fidell, 2001) to use CFA. In the context of study, a higher sample size could improve model fit results. However, all possible nurses representative of the target population in a tertiary and community hospital were recruited by all means available. The study had a high response rate that minimizes the nonresponse bias and increases the representativeness of the sample. Further testing in other APN settings is recommended. The test-retest stability of APN domains was performed in a time superior at the 2 weeks' period recommendation (Sousa & Rojjanasrirat, 2011). In the study, the intraclass correlation coefficient estimated reliability over time between 2 very similar assessments. This result may support the idea that most participants had a stable role and most participants performed the same role and performed the same tasks despite the longer interval between assessments. The construct was sufficiently stable that it would change negligibly over the 6-month period. The instrument warrants further testing and use in culturally diverse health care settings.

6 | CONCLUSION

By applying the theory and methods of psychometrics, the study focused on the lack of specific instruments in the Spanish context to describe advanced practices. Results showed evidence of the need for cultural adaptation of the original version of the APRD tool while demonstrating acceptable reliability and validity for use in nursing population study context. An existing valid, reliable tool in Spanish could allow description of the extent of advanced nursing practice and evidence of current practice expectations. The Spanish version of the APRD tool would be of great utility in clinical practice by gathering the necessary data to describe changes in nursing activities and domains described by the tool. The validated tool provides evidence of current practice and what activities could be implemented to further develop APN. This could overcome role ambiguity and sporadic role development by allowing comparison with other international contexts.

Defining advanced nursing practice using a validated, adapted instrument could allow health care managers and other regulatory or funding authorities to effectively deploy this experienced workforce to its full potential in all dimensions of practice, resulting in benefits to patients and greater efficiency within health care services.

CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

AUTHORSHIP STATEMENT

SSG and AZ conceived the study and obtain the funding. SSG, ERV and AZ were responsible for data management and study design. SSG, ERV and MGG were responsible for data collection, analysis and interpretation. All authors drafted and revised the manuscript.

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SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information tab for this article.

3. ARTICLE 3

"Profile of advanced nursing practice in Spain: A cross-sectional study"

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RESEARCH ARTICLE

Profile of advanced nursing practice in Spain: A cross-sectional study

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Abstract

In this study, we described the profile of advanced nursing practice in Spain. A cross-sectional study design was used to explore the extent and patterns of advanced nursing practice activity within the domains of expert care planning, integrated care, interprofessional collaboration, education, research, evidence-based practice, and professional leadership. Data were collected in 2015/2016. Purposive sampling yielded a sample of 165 specialist and expert nurses employed by a dual tertiary and community hospital in an urban setting. The study included specialist and expert nurses who had a higher practice profile than registered general nurses. The performance of activities according to age, current position, years of experience, nursing grade, and education was compared. Practice domains were more strongly influenced by the predictors of nursing position and professional career ladder. Age and experience predictors were found to be weak predictors of advanced practice domains. This study offers essential information of the nursing workforce, and clarifies both the advanced nursing practice profile and nomenclature in the context of study.

KEYWORDS

advanced practice, nursing role, specialist nursing education

1 | INTRODUCTION

The expansion of professional roles, such as advanced practice nurses (APN), has emerged as an innovative solution in pioneering healthcare reforms (Barton, Bevan, & Mooney, 2012). The Institute of Medicine (2010) and the International Council of Nurses (ICN) cited by Bryan-Lulosius & Martin-Misener 2016) have acknowledged the importance of nurses leading services in transforming organizations to fulfil the needs of current healthcare systems and contributing to achieving sustainable development goals set by the United Nations General Assembly (2015). The ICN defines the APN as a registered nurse with expert knowledge, complex decision-making skills, and the clinical competencies necessary for expanded practice (ICN, 2009). The main difference in the professional profile between APN and registered general nurses is the capacity of APN to take on more complex caseloads and manage them with greater independence, judgement, and accountability. For this reason, APN, including midwives, clinical nurse specialists, nurse practitioners, and nurse anesthetists, are pivotal human resources in the transformation of primary and specialist health care.

During the past decade, the European Higher Education Area (European Commission, 2015) established a system of comparable qualifications across Europe that upgraded Spanish nursing education from a 3 year diploma program to a higher academic pathway, which includes a 4 year degree, masters degrees, nursing specialties, and doctoral programs (Zabalegui & Cabrera, 2009). Nursing regulation in Spain identifies two professional nursing categories: general and specialist nursing. Since 2003, general nurses have had the opportunity to access the specialties of obstetric–gynecological nursing/midwifery, mental health nursing, occupational health nursing, geriatric nursing, family and community nursing, and pediatric nursing by undertaking a 2 year governmental residency in the clinical area. Additionally, there have been developments in nursing practice. New extended practice regarding prescribing rights for nurses has been

regulated (BOE, 2009), and accreditation for advanced practice has been published under the heading of continuous professional development (BOE, 2015). Furthermore, regional career ladders have been implemented across the country, giving nurses the right to progress professionally and to have their professional development recognized on the grounds of knowledge, experience, and meeting organizational objectives.

In the context of this study in Spain, where a prolonged economic crisis has exacerbated the shortage of highly-trained nursing personnel (OCDE, 2015) and led to a shortfall in healthcare resources (Zabalegui & Cabrera, 2010), the need to develop innovative nursing approaches to build a sustainable healthcare system is increasingly important (Morilla-Herrera et al., 2015). The progress in nursing education programs and professional practice has contributed to the unofficial introduction of pioneering roles in clinical practice that have a higher practice profile than that of general nurses. Some studies describe these emerging nursing roles as APN (Fabrellas et al., 2011; Morales Asencio et al., 2008) who have a superior level of practice and meet higher expectations within their service portfolio. In general, these nurses have higher educational qualifications, such as a masters degree, or a nursing specialty, such as midwifery, mental health, or community practice. Recent investigations also concluded that the development model of the specialist nurse in Spain corresponds to the international development model of APN (Giménez Maroto, 2013).

Despite the progress and advances in nursing educational programs and professional practice, the legal regulation or formal recognition of new APN roles has not been developed. With the exception of midwives, nurse specialists and emerging APN do not have access to established job positions, which could support a better understanding of the duties and responsibilities in their area of practice. This results in confusion regarding expectations among general nurses and APN, undermining their full potential, which can only be achieved if full recognition is attained and their introduction and implementation are successful (Liego, Loomis, Van Leuven, & Dragoo, 2014). The current lack of acknowledgment and legal framework lead to APN and specialist nurses engaging in fragmented and incomplete advanced nursing practice, increasing barriers, and confusion about their roles (Donald, 2010). To overcome the difficulties linked with APN introduction and implementation in Spain, greater knowledge and understanding is required on how these emerging innovative roles are being implemented (Balasubramanian et al., 2015), and to what extent nurses perform advanced nursing practice activities in their current positions. Thus, the main purpose of this study was to describe the profile of advanced nursing practice in Spain by exploring the extent and practice patterns of APN for the first time in the study context.

1.1 | Background

In this study, we adopted the recommendation to develop a comprehensive evaluation approach through a conceptual, evidence-based framework to assess how emerging roles of APN dynamically evolve with healthcare settings and population needs (Bryant-Lukosius et al., 2016). This conceptual framework defines key concepts to guide

organizations through the various implementation, management, and sustainability phases of APN, and reflects the complexity of the context in which they work. The evaluation framework provides conceptual clarity of the role of APN, as different positions develop different competences, practice skills, learning outcomes, and job descriptions (Schober, 2013). In this study, we addressed the topic through the learning evaluation methodology (Balasubramanian et al., 2015), which describes a method of multi-organization assessment through a mixed-method study. This approach is founded on five principles: (i) gather data to describe changes; (ii) collect relevant process and outcome data; (iii) assess multi-level contextual factors that affect implementation, process, outcome, and transportability; (iv) assist healthcare organizations in using data for continuous improvement; and (v) operationalize common measurement strategies to generate transportable results (Balasubramanian et al., 2015).

Achieving broad consensus on the definition of "advanced nursing practice" could be challenging, as countries are at different stages in developing and implementing these advanced roles. However, at a time when the role of APN is emerging in Spain, clarification and a greater understanding of the activities and functions that they cover represent a vital step toward successful implementation. This initial study focused on the first principle of the learning evaluation approach: gathering existing data to explore healthcare developments in Spanish organizations and to examine how these affect advanced nursing practice activity. In the context of our study, the hospital career ladder was used to define patterns of advanced practice activity at various nursing levels. The hospital career ladder followed the Patricia Benner model (Benner, 1984), and is based on local and national guidelines. The career ladder evaluates a set of competences, including knowledge, skills, and aptitudes, required by nurses within three dimensions: (i) generic and specific professional competencies; (ii) institutional commitment; and (iii) curriculum features. It consists of five possible levels, where level 1 is the lowest, usually acquired by junior nurses with a Bachelor of Science in Nursing, and level 5 is the highest, where a PhD is required.

1.2 | Study aim

In this study, we described the profile of advanced nursing practice in Spain between October 2015 and March 2016. We explored the extent and patterns of advanced practice activity according to nurses'/midwives' age, current position, years of experience, nursing grade, and educational level.

2 | METHODS

2.1 | Design

A cross-sectional study design was used to explore the extent and patterns of advanced nursing practice, in which nurses were engaged in the study context. Advanced practice domains and activities were measured using the Spanish version of the Modified Advanced Practice Nursing Role Delineation (M-Strong APRD) tool (Chang, Gardener, Duffield, & Ramis, 2010). The study followed the

STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) statement for observational studies (Von Elm et al., 2008).

2.2 | Participants

The study population included all Spanish specialist nurses (including midwives, mental health specialists, geriatric nurse specialists, and occupational health nurses) and all expert nurses identified by the authors as nurses with a higher practice profile and a more extended service portfolio than general nurses in Spain. The nurses identified held the position of registered general nurse within the hospital, but engaged in activities, such as complex decision-making, expert consultancy, or expanded domain activities, beyond those competencies defined in the European Higher Education Area (European Comission, 2015). The specialist nurses included also worked as general nurses but had attained specialist nursing government qualifications. Purposive sampling yielded a sample of 165 nurses employed by a dual tertiary and community hospital in Barcelona, Spain, and was conducted in a setting that serves a dual mission of a community and highly-specialized tertiary public hospital, with a total nursing staff of 2076. A total of 165 specialists and expert nurses were identified as eligible to participate, with the aim of obtaining a composite profile of the study population. Prior to the study, hospital data, such as career ladder level and job positions, were scrutinized. Interviews were conducted by the researchers with all hospital head nurses and those in managerial positions to identify all expert nurses practicing at higher care provision levels. To further determine sample characteristics and degree of expertise, hospital data on hospital career ladder levels and job positions were collected. Sample size was determined by including all possible expert and specialist nurses working in the study context. Nurses with managerial positions and no direct patient care duties were excluded from this study, as clinical practice was considered a central characteristic in advanced practice.

2.3 | Data collection

Data were collected between October 2015 and March 2016 through the Spanish version of the APRD tool. The tool was originally developed by Mick and Ackerman (2000) with the aim of describing intensive care practitioners based on the strong model for APN (Ackerman, Norsen, Martin, Wiedrich, & Kitzman, 1996). The instrument was then modified and validated by Chang et al. (2010) for APN role delineation in the present global healthcare context. The M-Strong APRD tool consists of 38 items across six practice domains: (i) expert care planning; (ii) integrated care; (iii) interprofessional collaboration; (iv) education; (v) research and evidence-based practice; and (vi) professional leadership. The activities falling within each practice domain described by the tool were specific and set the level of engagement expected for advanced practice actions.

The tool previously demonstrated evidence of cross-cultural equivalence and acceptable reliability and validity for use in a nursing population in the Spanish context. Content validity of the tool was supported by a previous study and an expert panel (Sevilla & Zabalegui, 2016). Factor analysis endorsed the construct validity of the Spanish version of the tool. Reliability was estimated by internal consistency and test–retest stability. Test–retest stability measured through intraclass correlation provided a stable score over time and there was good internal consistency, with a Cronbach's alpha equal to 0.86, which exceeds the minimum criterion of 0.7 (Nunnally & Bernstein, 1994). A website form was generated by the researchers, and only those professionals who agreed to participate completed the questionnaire, which was restricted to one response per participant. The tool had two separate parts: one to collect sociodemographic data, and a second part with the instrument. Participants were asked to specify how much time they spent on each of the indicated activities. A five point Likert scale was provided (0 = not at all, 1 = to a small extent, 2 = to some extent, 3 = to a great extent, 4 = to a very great extent). Scores ranged from 0 to 164. All questions were mandatory to minimize the missing data. The purposive sample was contacted by email, which contained a link to the Web-based instrument.

2.4 | Ethical considerations

The study was approved by the Clinical Research Ethics Committee (CEIC) at Hospital Clínic, Barcelona (exp no. HCB/2014/0811). Participants provided written, informed consent prior to participation in the study. Participants were guaranteed anonymity in the findings report and research analysis.

2.5 | Statistical analysis

The results of the statistical analysis are reported as mean (standard deviation) for continuous variables, and number (%) for categorical variables. One way analysis of variance (ANOVA) test was performed to compare the performance of APN activities according to age, current position, years of experience, nursing grade, and education. Logistic multivariate regression models were constructed to analyze independent factors associated with APN activities. Variables with $P < .1$ in the ANOVA were included in the models, and stepwise model selection by the Akaike information criterion was used. Beta coefficient and standard error were provided for each domain for predictors of the extent of APN activity. The explained variance of the models was computed and denoted as adjusted R^2. All significance tests were two tailed, and $P < .05$ was considered significant. All analyses were conducted using the R v.3.2.3 for Windows statistical software package.

3 | RESULTS

A total of 151 responses were obtained, with a response rate of 91.5%. Sociodemographic data and sample characteristics are shown in Table 1. All age groups were evenly represented in the study, in a range from 21 to $\geq$60 years. The $\geq$60 age group was the least represented, with 5.3% of participants. The participants had a range of positions, including registered midwives (23.8%), registered clinical nurses (15.9%), outpatient nurses (15.2%), unit managers (7.9%),

TABLE 1 Sample characteristics (n = 151)

Variable	N (%)
Age group (years)	
21–34	48 (31.8)
35–49	53 (35.1)
50–59	42 (27.8)
>60	8 (5.3)
Current position	
Registered midwife	36 (23.8)
Registered clinical nurse	24 (15.9)
Outpatient nurse	23 (15.2)
Nurse/midwife unit manager	12 (7.9)
Emergency nurse	10 (6.6)
Case manager	10 (6.6)
Registered nurse anesthetist	10 (6.6)
Public health nurse	7 (4.6)
Reanimation unit nurse	6 (4)
Nurse educator	5 (3.3)
Hospital at home nurse	4 (2.6)
Consultant nurse	3 (2)
Bed manager nurse	1 (0.7)
Years of experience	
0–5	67 (44.4)
5–10	39 (25.8)
10–15	19 (12.6)
15–20	1 (0.7)
20–25	15 (9.9)
>25	10 (6.6)
Current nursing grade (own hospital career ladder)	
Level 0	28 (18.5)
Level 1	14 (9.3)
Level 2	15 (9.9)
Level 3	36 (23.8)
Level 4	42 (27.8)
Level 5	2 (1.3)
Other	14 (9.3)
Highest level of educational qualification	
Nursing degree	25 (16.6)
Postgraduate diploma	19 (12.6)
Specialist nurse (obtained by the exceptional or direct way)	12 (7.9)
Specialist nurse (obtained by internal residency)	17 (11.3)
Masters degree	54 (35.8)
PhD	3 (2)
Other university studies	21 (13.9)

case managers (6.6%), emergency nurses (6.6%), nurse anesthetists (6.6%), and others (17.4%). A high proportion of respondents had completed a masters degree (35.8%), and 19.2% of the participants were nurse specialists. The two groups that were most represented on the hospital career ladder were level 3 (23.8%) and level 4 (27.8%), out of five possible levels, where level 1 is the lowest and level 5 is the highest, meaning that most participants were in the middle/upper tier of the organizational career ladder in the study context.

3.1 | Extent of advanced practice activity

The performance of APN activities according to age, current position, years of experience, nursing grade, and education is shown in Table 2.

A statistically-significant association was found between current nursing position and the six APN practice domains, confirming that there is a specific APN activity pattern according to current nursing position. Outpatient registered nurses performed more APN activities in the domains of expert care planning (mean = 3.4), integrated care (mean = 3.3), and education (mean = 2.5) compared with those in other nursing positions. Midwife unit manager nurses carried out the most interprofessional collaboration, research and evidence-based practice, and professional leadership. Nursing grade was related to four of the six APN domains: (i) interprofessional collaboration (P < .001); (ii) education (P = .001); (iii) research and evidence-based practice (P < .001); and (iv) professional leadership (P < .001). There were no associations between current nursing grade and the dimensions related to clinical practice. Furthermore, current nursing grades showed a linear relationship with the education domain, with higher nursing grades corresponding to more APN activities in education. However, nurses on level 3 of the professional career ladder performed fewer APN activities in the domains of interprofessional collaboration (mean = 1.4), research and evidence-based practice (mean = 0.8), and professional leadership (mean = 1.1) although this increased again in levels 4–5, showing an up–down–up pattern. In addition, age and years of experience proved to have an association with three APN domains: interprofessional collaboration, education, and professional leadership. Regarding educational qualifications, a higher level of education (masters degree/PhD) was associated with more APN activities in interprofessional collaboration (P = .005), research and evidence-based practice (P = .002), and professional leadership (P = .004). The professional leadership domain was the only one that showed a statistically-significant association with all variables.

3.2 | Patterns of advanced practice activity

A multivariate analysis was performed to examine independently-associated variables with APN domains to show all the meaningful predictors of APN activity. For each domain, Table 3 summarizes the predictors of the extent of APN activity in the study. The results show that nurses working as registered midwives performed more APN activities than other nurses in the dimensions of expert care planning (P = .004), integrated care (P = .004), and education (P = .018). Being an outpatient registered nurse was also a predictor of higher APN activities in expert care planning (β coefficient = 0.8) and integrated care (β coefficient = 1.1), while case managers were more active in integrated care and interprofessional collaboration. Nurse anesthetists appeared to have a negative effect as a predictor for APN domains, performing fewer APN activities than other nurses in the interprofessional collaboration (β coefficient = −0.8) and professional leadership domains (β coefficient = −0.8).

With regard to nursing grade on the professional career ladder, levels 1–2 and 4–5 were strong predictors of higher levels of

TABLE 3 Predictors of theextent of advanced practice nursing activity for each domain

Variable	β estimate (SE)	P-value	Adjusted R²
Expert care planning			0.111
Registered midwife	0.7 (0.2)	.004	–
Outpatient registered nurse	0.8 (0.3)	.006	–
Integrated care			0.173
Registered midwife	0.7 (0.2)	.004	–
Outpatient registered nurse	1.1 (0.3)	<.001	–
Case manager	0.9 (0.3)	.011	–
Support of systems			0.346
Age group ≥50 years	0.6 (0.2)	.004	–
Nurse/midwife unit manager	1.2 (0.3)	<.001	–
Case manager	0.6 (0.3)	.033	–
Registered nurse anesthetist	−0.8 (0.3)	.007	–
Education			0.183
Registered midwife	0.6 (0.3)	.018	–
Current nursing grades 1–2	0.9 (0.3)	.001	–
Current nursing grade 3	1 (0.2)	<.001	–
Current nursing grades 4–5	0.9 (0.3)	<.001	–
Research			0.163
Current nursing grades 1–2	0.7 (0.2)	.005	–
Current nursing grades 4–5	0.8 (0.2)	<.001	–
Specialist nurse (obtained by internal residency)	0.7 (0.3)	.012	–
Masters degree/PhD	0.5 (0.2)	.018	–
Publication			0.269
Accident and emergency registered nurse	−0.7 (0.3)	.023	–
Registered nurse anesthetist	−0.8 (0.3)	.009	–
Years of experience >15	0.7 (0.2)	.002	–
Current nursing grades 1–2	0.8 (0.3)	.002	–
Current nursing grades 4–5	0.6 (0.3)	.045	–
Specialist nurse (obtained by exceptional or direct way)	−0.8 (0.3)	.013	–

SE, standard error.

practice domains and activities. The results showed the extent of advanced nursing practice activity by most of the nurses that participated in the study, with registered midwives performing more advanced practice activities than nurses in other positions. Nursing grade on the hospital career ladder also had a strong relationship with most domains, and was a relevant predictor for the domains of education, research, and professional leadership. Age, experience, and education were seen to have the least affinity with advanced practice dimensions, and were poor predictors in the study context. Traditionally, advanced practice activities have not influenced the conceptualization of nursing roles, therefore age, experience, and education have not been taken into account when implementing new nursing services. In previous studies, age and experience have been shown to not influence the level of advanced practice nursing activities that these nurses perform (Gardner, Chang, Duffield, & Doubrovsky, 2012), unlike education, where those with higher levels of education perform significantly more advanced practice activities in most domains.

The introduction of a common European framework and a wide range of postgraduate education courses in nursing have supported progress in education, although nursing reform and curriculum design in Spain has been introduced only recently and is still at an early stage (Zabalegui & Cabrera, 2009). Nevertheless, participants' educational level showed a well-founded association with interprofessional collaboration, professional leadership, research, and evidence-based practice. There was no specific nursing position that strongly influenced all APN dimensions. Despite educational advances and recognition of the academic distinction between general and specialist nurses, in clinical practice, there are no specific positions for these highly-trained professionals, which limits the potential benefits they could bring to their practice. Midwives could be considered to be in a privileged situation compared with other peer specialists, as midwifery is the only specialty that is recognized professionally. This could explain why midwives perform the most advanced practice activities, as they are capable of practicing in an autonomous manner, particularly in expert care planning, integrated care, and education as see in the results of this study.

In contrast to the original study (Gardner et al., 2012), this study results did not show a linear relationship between nursing grade and advanced nursing practice domains, with the exception of interprofessional collaboration and research. The findings support some current nursing positions as strong predictors of advanced practice activity in clinical practice, possibly indicating than further

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professional development in other advanced nursing practice domains is required in these positions, such as interprofessional collaboration, research and evidence-based practice, and professional leadership. These non-clinical domains are necessary to integrate all advanced practice activities, and could have an impact on the effectiveness of the roles (Bryant-Lukosius, Beauchesne, Farrelly, & Murphy, 2013). The integration of these domains has demonstrated its effectiveness in improving health systems, patient outcomes, efficiency, and effectiveness (Bryant-Lukosius et al., 2015; Donald et al., 2015). The development and implementation of APN affects healthcare delivery, organization, management, workforce planning, policy, and research outcomes (Andregård & Jangland, 2015), creating sustainable nursing services that meet the needs of the study context. Currently, there are no available workforce data identifying the number of nurses working as specialist nurses in Spain, just as there is no distinct nursing registration for trained specialist nurses. Most specialist nurses work as general nurses, as there is a shortage of suitable advertised positions and strong competition among nurses to obtain those that do exist. Approximately 49% of general nurses in Spain were found to be unable to educate patients due to lack of time (Aiken et al., 2012), which reflects the absence of support for advanced practice. The lack of nursing positions in clinical practice clashes with research evidence in the literature on the need to increase nursing positions in a sustainable way (Aiken et al., 2014). Understanding the extent and patterns of advanced nursing practice could stimulate healthcare organizations to create evidence-driven policies in nursing practice to promote the recognition, creation, and development of specific professional positions. Reporting on current contextualized practice and organizational capacity could help organizations to assess the trade-offs in developing service delivery (Green, Glasgow, Atkins, & Stange, 2009). The findings reveal a context where the role of APN is currently being developed, but has not been fully implemented, and could contribute to the existing conceptualization of the advanced nursing practice profile in the study context.

In line with previous studies, our study also identified a lack of strategic workforce planning and low performance (Roche et al., 2013). Advanced practice domains were influenced by nursing position and professional career ladder, rather than age and expertise, which were found to have no influence on predicting advanced practice activity in the study context. The data allowed description of the extent and patterns of advanced practice to facilitate description of change management and implementation of healthcare reforms. Recognition and implementation of advanced practice positions could have an influence on practice, effectively allowing innovative nursing roles to reach their full potential. The findings should provide support for evidence-driven policies to achieve effective and sustainable healthcare services and a workforce that can reach their full potential. Our results could be useful in future research regarding advanced practice nursing, allowing a comparison of advanced practice roles with those in international contexts.

4.1 | Study limitation

A limitation in this study was in the generalization to the entire population. In the study context, all nurses who were representative of the target population in a tertiary and community hospital were recruited by all means available. The study had a high response rate, which minimizes non-response bias and increases the representativeness of the sample. Further testing in other advanced nursing practice settings, such as primary care, is recommended.

5 | CONCLUSION

This study is the first to describe the profile of advanced nursing practice in Spain by exploring the extent and patterns of advanced practice activity in newly-developing roles. The conceptual model of APN innovation is a necessary step toward defining strategic visions and priorities, and recognizing failures that should be taken into account to ensure improved and sustainable healthcare services. The conceptualization of the advanced nursing practice profile provides data on APN activities and domains in the Spanish context, as well as descriptions of healthcare adaptation and change management. The study has important implications for the optimum and sustainable use of the nursing workforce in a public community and tertiary hospital, and describes the nursing profile and nomenclature in the study context. Defining the extent of advanced practice activities and domains using a validated, adapted instrument could help organizational leaders and authorities to manage the resources and expert workforce to support sustainable and effective new ways of working in all dimensions of clinical practice, eventually resulting in advantages to patients and fast-changing healthcare organizations.

CONTRIBUTIONS

Study design: S.S.G., J.M.S., and A.Z.
Data collection: S.S.G., J.M.S., and A.Z.
Data analysis: S.S.G., and A.Z.
Manuscript writing and revisions for important intellectual content: S.S.G., and A.Z.

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4. ARTICLE 4

"Contextual factors of Advanced Practice Nursing development: A Network Analysis."

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Contextual factors of Advanced Practice Nursing development: a Network Analysis.

Abstract

Background: The complexity and difficulties involved in the development and implementation of health innovations such as advanced practice nursing roles result in slow, sporadic global deployment. To manage this complexity, achieving a deeper understanding of the context in which these innovation processes take place is advisable. **Objective:** To understand and provide a visual network of relationships connecting contextual factors in Advanced Practice Nursing development in Catalonia. **Design**: The study design is qualitative, descriptive and explanatory. **Settings:** Participants from diverse perspectives of practice, organization and external environment were engaged to participate in semi-structured focus groups in March 2016. **Methods:** Participants were asked to report on various dimensions of the role development context: understanding of the role, felt needs, perceived outcomes, barriers and facilitators. **Results:** Four focus groups were formed for the study. Primary data analysis performed for 44 participants identified 71 related contextual factors associated with role development. Complementary network analysis revealed multiple relationships and agreements among participants and context-related themes. Professional roles and disciplines clustered around topics show consensus and the significance of topics. **Conclusion:** Understanding the level of interactions and consensus among participants and contextual factors will ultimately allow better insight into how complex contexts influence the development of advanced practice nursing in healthcare organizations.

Introduction

Contextual changes have transformed work environments at the organizational level both nationally and locally. The constant demand for healthcare resources has been closely linked to the modernization of professions and the need to find innovative solutions, such as the expansion of professional roles (Bodenheimer & Smith, 2013). Optimizing human resources such that they reach their full potential has also allowed Advanced Practice Nursing (APN) to contribute as part of the nursing profession. The International Council of Nurses (ICN) defines the APN as a registered nurse with expert knowledge, complex decision-making skills, and the clinical competencies necessary for expanded practice (International council of nurse practitioner/Advanced practice nursing network, 2009) who has the capacity to take on complex caseloads and manage them with greater independence and accountability as a pivotal human resource in the transformation of primary and specialist healthcare. The institute of medicine (Institute of Medicine, 2011) and the International Council of Nurses (Bryant-Lukosius et al., 2017) have acknowledged the importance of the nurse's role in leading transformations in healthcare services and helping healthcare systems to be more capable of meeting the needs of the population in the future. This will ultimately contribute to achieving sustainable development goals set by the World Health Organization (United Nations General Assembly, 2015). Nonetheless, there is strong consensus around the difficulties associated with the development and implementation of a number of types of APN roles. Introducing and implementing APN roles in public healthcare organizations, such as those present in Catalonia, is described as a long, difficult complex process (Andregård & Jangland, 2014; Sangster-Gormley, 2013).

In Catalonia, one of the 17 regions in Spain, the provision and characteristics of public healthcare services are the responsibility of the Catalan Government. The costs of financing the obligations of the Catalan Health Service are met through a combination of resources from the public administration, contributions and fees, and incorporate system governance-related elements, which, in conjunction with health goals, make up the complete picture of how the health system should be (Constante & Beitia, 2015). Currently, the central aims are stimulating the improvement of service provision, quality, efficiency and other aspects such as accessibility, integration, efficiency, safety and satisfaction. Implementing the

transformations of the various Catalan Health Plans over recent years has created alternative models of care that required new and innovative nursing mandates. Currently, several pilot projects are being implemented in Catalonia to try to develop APN roles in primary and hospital care (Fabrellas et al., 2011). These preliminary initiatives have met with difficulties and despite professional and academic advancements in nursing, with the exception of midwives, APN roles have not been formally introduced with recognized titles. New roles have not been regulated and their activities and functions are poorly understood in practice.

Internationally, deployment and implementation of APN roles have also been slow and sporadic (Dicenso & Bryant-Lukosius, 2010). According to Bryant-Lukosius, DiCenso, Browne & Pinelli (2004), the implementation of new APN roles is as complex and dynamic as the roles themselves and development issues could, in part, be explained by this complexity. The way cultures and societies have embraced changes related to APN roles has been essential in the successful development and sustainability of new roles. Many studies deal with the complexity of APN development and implementation by addressing contextual factors that facilitate or hinder the process (Chaudoir et al., 2013; DiCenso, Bryant-Lukosius, Bourgeault, et al., 2010; Sangster-Gormley Et al., 2011). These studies describe multiple factors that can influence the success of role development. However, the themes or categories presented make it difficult to highlight the synergies, dynamics and non-linear interactions of the data they contain that can influence the way care is provided.

The need to understand how contextual factors influence patient care and outcomes is well recognized and efforts have been made to assess and measure them. However, the role that context and work environment plays in the development of health care interventions remains poorly understood (Dowling, Beauchesne, Farrelly & Murphy, 2013; Howarth et al., 2016) and context analyses are often limited in their ability to describe the complex and varied circumstances surrounding the development of new knowledge, practices or nursing roles (Pinto, 2015). Although understanding the contextual factors is fundamental to successful knowledge transfer and development of new complex interventions (Kaplan, 2010), there is no best way to analyze the context of intricate healthcare systems and how the main factors, characteristics and actors interact. Contextual factors are undeniably dynamic, but to be able to grasp the

synergies and relationships between contextual factors and other elements such as the professional groups or organizations involved, it is necessary to apply other methods to better understand associations among them. This study uses Network Analysis (NA) to visualize the structure of relationships connecting participants with the contextual factors in APN development. The use of NA makes it possible to understand and visualize the relationships between the actors and the contextual factors associated with the development of the advanced practice role. This understanding of a complex system, in which the sum of the interconnected or interlaced parts of the network and their links create additional information not previously seen by the observer, may help organizations to understand the full dimension of context and to ultimately predict or act upon development of APN roles. To overcome these difficulties linked to the development of APN roles, our aim is to deepen understanding of how these roles develop in their practice context (Andregård & Jangland, 2015) and how contextual factors interact.

Background

This study was guided by the Framework of Contextual Factors inspired by Tomoisa-Cotisel et al. (2013) for reporting relevant context in research studies. The framework recommends that to understand context, analysis of data resources at multiple levels and from separate systems is required. The recommendations are designed to assist with reporting on relevant context for complex phenomena and are used as a guide in interpreting interactions and the development of process and outcomes. The framework proposes that involving diverse participants at multiple stages and consistently reporting critical contextual factors are important challenges for a field interested in improving the internal and external validity and impact of health care research. It shows that the most important contextual factors can be classified into 5 domains, three of which are level-specific and two which can be considered transversal: (1) the practice setting, (2) the larger organization, (3) the external environment and two cross-cutting themes: (4) implementation pathway, and (5) the motivation for implementation. The specific levels refer to the interrelated and sometimes hierarchical nature of contextual factors and the cross-cutting themes refer to the process and sequence of implementation across levels. The framework recommends engaging different perspectives, considering multiple levels and evaluating the development of contextual factors. A multilevel grid provides a

systematic way of reporting context and offers an opportunity to maximize understanding of the contextual information. The authors of the framework also encourage assessment (often nonlinear) of interactions between contextual factors and both the process and outcome of study, although these relational characteristics could be challenging to analyze and define in descriptive studies. How context structure and relationships act to influence the development of new interventions such as APN could be better grasped through analysis of the relationships that link elements of context in a network analysis (Luke & Harris, 2007).

Some studies have used NA as a theoretical discipline (Hummon, 2003) to focus on patterns and links between actors. This model has been used to explore a wide range of structural and relational health aspects and public health systems (Contrandriopoulos et al., 2016). Among many other areas of interest, Luke & Harris (2007) report on the use of network analysis for developing and implementing health interventions, for instance using network characteristics to identify central actors to speed up diffusion of health information. This review showed that a network can be a conceptual model that consists of actors that represent individuals, organizations, programs or other elements. Networks usually have numerous actors linked by lines which show a relationship between them. Colour and size of nodes can show particular characteristics and roles (Freeman, 2004) within the network. In NA, quantitative visual representation and interpretation could be used to optimize the presentation of narrative data and facilitate their qualitative (visual) interpretation (Contandriopoulos et al., 2017). NA offers an alternative, powerful complementary option to other common approaches designed to make sense of narrative data (Healy and Moody, 2014) and provide new knowledge that other methods may not reveal. Other studies have been conducted to explore the usefulness of this social approach in the healthcare context, such as identifying the strengths and weaknesses of health-related networks in the primary health care context (Rastegar-Panah et al., 2013), describing network influences in health (Smith & Christakis, 2008) and exploring health behaviors (Latkin, C & Knowlton, 2015).

To enrich the interpretation of qualitative narratives, the study aims to conduct a complementary data analysis using an NA concept model that explores the context of APN development in Catalonia, Spain. Studies on the relational forms

of narrative data are scarce in healthcare research (Contandriopoulos et al. 2017).

No other studies have been found that examined context and social interactions in the development of APNs. By mapping interactions and shaping the synergies of main context nodes and attributes, the study builds a comprehensive understanding of the dynamics of context and contributes to previous analysis of static narrative data described in the literature.

The study

Aim

The aim of this study was to understand and provide a visual network of relationships connecting contextual factors in Advanced Practice Nursing development in Catalonia.

Design

In the main research study, a qualitative exploratory design was chosen to explore the contextual factors that influence the development and implementation of APNs in Catalonia, Spain. Due to the current lack of knowledge on the subject, the research method used was qualitative, descriptive and explanatory (Paillé & Mucchielli, 2009). Qualitative data that now constitute a large part of available data on innovation (Want, 2013) and provide a good understanding of how the implementation of interventions develops over time could generate practical action guidelines (Landau & Drori, 2008). Based on the Framework of Contextual Factors (Tomoisa-Cotisel et al., 2013), semi-structured focus groups were formed to explore the primary research questions: (1) perception/understanding of APN, (2) felt needs and motivations to develop APN, (4) perceived added value/outcomes of APN and (4) perceived barriers and facilitators present in the Catalonia (Spain) context at the external, organizational and practice level.

Sample/Participants

Recruitment was done by purposive sampling establishing, *a priori*, potential actors to be interviewed. As achieving a comprehensive understanding of the

emergence of an innovation requires multi-level analysis of the various actors and levels involved, (Pfadenhauer et al., 2015) a maximum variation sample was recruited following the recommended contextual levels of the framework of reference. This helped with the collection of diverse experiences from clinicians and managers that help shape the practice environment, others outside the organization in the political, marketing, finance and educational areas, and coordinators between levels of care. The inclusion criterion was that participants were mainly employed in a field that was directly or indirectly linked to the process of development and implementation of APN. Participants were selected because they were viewed as able to provide information on one or more of the various dimensions of the Catalan context; political, cultural, educational, organizational, professional or/and population to maximize the range of responses coming from distinct environments or organizations.

Data Collection

Data collection was conducted between March-May 2016. Semi-structured interview guides were developed and validated by the researchers based on the framework of reference. Focus groups were conducted, distinguishing among groups of clinicians, actors involved in management within a main tertiary and community hospital and participants from the wider academic, political and decision-making spheres in Catalonia.

Ethical Considerations

Ethics committee approval was obtained from the relevant organization (Reg. HCB/2016/0055). Participants were asked whether they agreed to participate in the study prior to joining the focus groups. Participants were assured of the anonymity of their responses in the findings report and research analysis. Participants who provided signed informed consent indicated their consent to participate in the study.

Data Analysis

Preliminary data analysis

Data were recorded, transcribed and analyzed following multiple stages to achieve thematic analysis. Following the group interviews, in-situ manual categorization of data and creation of themes was performed. The manual

categorization of data was done by four researchers involved in the focus groups using recorded audio data and notes. This step was followed by revalidation of recorded data and revalidation with the researchers. Following initial categorization analysis, results were shared with the participants without drawing conclusions before the data was fully analyzed. As a second step, data-analysis software NVIVO 11 was used for coding focus group data, understanding conceptual relationships and counting key words. Data analysis with software allowed identification of patterns and helped to establish relationships within complex data. The data were used to build a list of themes (DiMaggio, 1997) representing the essence of each distinct complex contextual factor. Each theme was summarized to facilitate coding but was related to a longer definition in the NVIVO codebook. Schemata were organized according to the four topics covered by the interview questions: perceptions of APN, felt needs and motivations to develop APN, perceived added value and outcomes, and perceived barriers and facilitators present at the external, organizational and practice level.

Complementary data analysis

Complementary data analysis was conducted based on the SNA method to analyze previous narrative coded data. SNA was performed according to the Contrandriopoulos et al. (2017) model to build on the knowledge gained through preliminary qualitative findings on the research question. A matrix was created, based on two-mode network analysis, where columns and rows represent nodes and cases, and entries represent convergent themes among them. The matrix (Supplement 1) had three main characteristics: (1) the rows representing individual and group cases of participants; (2) columns representing the themed nodes of contextual factors that emerged in the focus groups; and (3) entries with an "x" were placed in the column of each participant who raised the theme in the focus group.

The matrix connected two separate elements, cases (participants) and nodes (contextual factor themes) by transforming the nature of data from narrative to relational and linking each entry to participants that mentioned a particular theme. To store node and case attributes, the study used rows and column labels as recommended (Contrandriopoulos et al., 2017). For instance, participants were coded as Participant (P)- Case Group (P: Practice; LO: Larger Organization; EV: External Environment) - sequential number - professional role – discipline, while

context factors were coded as Context (C)- factor (Barrier, Facilitator, Need, Outcome, Role) – sequential number – brief description.

The matrix then was integrated into NA Software Cytoscape 3.5.1. which offers visualization options for network interpretation. Network visualization was obtained by optimizing the visual display of the network by 'force-directed' algorithms (Cline et al., 2007). Force-directed networks are based on the principle that nodes (participants and themes) are mutually repulsive and the links act as attractive forces. The use of a force-directed network layout means that isolated nodes will be minimally interconnected while nodes found close to participants will be positioned next to them. The closer the nodes, the greater the connection between them. Moreover, context nodes in a balanced position close to clusters of participant nodes will indicate consensual data among them. Furthermore, the size of the nodes was established as proportional to the number of links connected to one node, meaning that larger context nodes were those more frequently mentioned by participants and larger participant nodes symbolize greater prevalence of interactions with contextual themes in the data. To further assist with analysis and visualization of the network, node shape and color was customized. Different colors were assigned to the distinct participant and contextual nodes (participants in grey, perceived role in purple, needs in yellow, outcomes in blue, barriers in red and facilitators in green). Additionally, for participants in a managerial position, a darker shade of grey was used to differentiate them from practice or other positions. On the name of the node the professional role was kept as a short description to provide further details. Participant nodes were also depicted according to the participant's discipline; a triangle for nurses, a circle for medical doctors and rectangles for others such as an individual allied health professional, a pharmacist, a psychologist, a HR manager, an engineer and an economist.

Rigor

NA used coded data to transform it into relational patterns. The validity and reliability of this analysis rely on the rigor of the primary data-collection process. In the primary data-collection process, reliability of data was established by comparing responses from each focus group at the practice, organizational and external environment level. Credibility was achieved by reading each transcript, multiple coding it into basic themes by the same researchers and finally into a

coding frame where all the data were accounted for in similarity of content and substance and thereby demonstrated internal consistency (Silverman 2006, p.289). In addition, a researcher checked with focus group participants who reviewed the themes for content validity. The trustworthiness of primary analysis influences the limitations and biases of missing links or relationships within the data. However, comparing qualitative interpretations of the original narrative data against information derived from the network analysis also improved the validity of findings by making sense of the relationships between participants and themes through two separate analyses. Quality of measurement, especially reliability, could be affected by the type of support (Ferligoj & Hlebec, 1999) where support networks are usually more important and close to participants.

Findings

Demographics

A total of 44 participants were interviewed with a response rate of 86.5%. Four semi-guided group interviews were conducted in March 2016 with 1) clinicians, mainly consisting of nurses that carry out advanced practice and managers from various services who were in direct contact with everyday practice 2) managers and actors involved in management within the hospital organization, as well as participants from 3) academic, political and decision-making spheres. All age groups were represented in the study, with participant ages ranging from 20 to over 70 years old. The 50 to 59 year old group was the most highly represented with 53% of the total. Most were female (68%) and the vast majority had high educational qualifications such as a master's degree (59%) or a PhD (32%). All participants were employed directly or indirectly in the process of developing or implementing APN roles in a variety of disciplines such as nursing (62%), medicine (27%), human resources (2%), midwifery (2%), psychology (2%) or others such as university professors, an engineer or an economist. Some 84% represented the public sector with the other 16% representing private, non-profit or sole-trader organizations. A wide range of practice settings were represented with 29 participants based in the hospital setting, 5 in the community, 4 in secondary care and academia and 2 at other health care providers. A total of 84% of the participants were based in a metropolitan urban environment with the rest working at regional or national level.

Following preliminary analysis, remaining codes were 14 for role perceptions, 10 for felt needs, 12 for perceived added value/outcomes, 18 for barriers and 17 for facilitators present at the external, organizational and practice level. Once the codes were finalized, all summaries were reviewed to ensure coding was consistent throughout.

Network Description

A visual map of the structure of the relationships connecting all data on contextual factors in APN development in Catalonia was drawn up (Figure 1). Each node represents a case or contextual theme, and the links or arcs tie participants to each of the corresponding themes that they mentioned in the groups. In their interviews, informants raised, on average, 7 different contextual factors per participant, ranging from number one (6.8% of total contextual themes) to number sixteen (2.27% of total contextual themes). Contextual themes mentioned ranged from number one (19.7% of participants) to number 18 (1.4% of participants). Some 75% of participants referred to contextual barriers while 59% raised contextual facilitators for the development of APN in Catalonia. Outcomes associated with the perceived value of the APN was the least mentioned by participants (34%). All relevant contextual themes are represented in Figure 2.

In summary, the network presented a total of 115 nodes, where 44 nodes were participants and 71 nodes were related contextual factors associated with role development. The connected component value was 1, indicating that all participants and contextual factors were highly interconnected. The diameter value was 6, showing that between the two most distant network nodes, the shortest path, that is, the one using the least links, was the one that used 6 arcs or links. On the other hand, the radius was 4, showing that between the two closest network nodes, the shortest path was the one that used at least 4 arcs. These indicate a relationship range of between 6 and 4 links between the closest and the most distant participant and contextual factor nodes. On average, the minimum distance for the entire network was 3.15 nodes and was decentralized, with a centralization value of 0.115. The network was not particularly dense, with a density of 0.045, close to 0, meaning that there was a low probability that pairs of nodes are related. The clustering coefficient was near to 0.001, indicating a very low probability that if two nodes were linked to a third node, they would be

linked to each other and the average number of neighbors was 5.165 for the total of 115 nodes.

For all relevant topics, the network analysis highlighted three main core elements that stood out as being central and mentioned by a great majority of participants from the local, organizational and wider environment. Most nursing managers (dark grey triangles) were clustered together next to the main core topics, illustrating some consensus among them on the topics most frequently mentioned by them. The NA revealed that understanding of the APN role (CROLE5) was at the center of the network, raised by 75% of participants and it consequently appears as the largest node. This node refers to the main core skills, competences and qualifications of APNs and indicated emphasis and balance among participants regarding the topic. In the network, a clustering effect was detected around the perception and understanding of APNs where data from four different nodes converged at the center: leadership, complex decision-making, adoption of evidence-based practice and understanding of main skills, competences and qualifications. Given the data characteristics, specialization, autonomy and comprehensive integrated care were also significant topics related to understanding of the role but were less frequently mentioned.

Additionally, some aspects were analyzed more closely to better understand which are crucial to APN development and implementation in Catalonia (participants-to-felt-needs and outcomes, participants-to-barriers and participants-to-facilitators in APN development).

Perceived needs and outcomes in APN development

A graph (Figure 3) was prepared that focused on the participants felt needs and perceived potential outcomes in the development of APN. When the focus was on these two topics the balance of the network shifted. On average, participants discussed 5.6 distinct needs-related topics and 2.5 separate outcomes-related topics. Perceived outcomes was the least-raised contextual factor (34%) among participants. Conversely, the most salient (increased efficiency and sustainability) need was raised by 12 participants while the least (accessibility) was raised by one. This resulted in a core cluster of needs-related themes at the center of the network. The most significant and consensual needs in APN development mentioned by participants were increased efficiency and sustainability (CNEED5), patient education (CNEED6), professional support for the role

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(CNEED10) and more efficient care processes (CNEED4). The need for adoption of evidence-based practice and reduced care fragmentation (CNEED3) was mentioned solely by nurses. On the other hand, patient safety (CNEED2) and improvements in accessibility (CNEED1) were only mentioned by medical doctors. As such, both sets of needs where placed at opposite margins of the network, which indicates dissent on needs-related topics.

Managerial roles cluster together around the perceived needs of the role while outcomes-related topics showed no mayor clustering of any specific category of participants around any particular outcomes. The network analysis could not highlight differences between participants from the local, organizational and wider environment. Outcomes appear to be quite dispersed through the network although most were interrelated with nursing positions, with only efficiency (COUTCOME7) raised by a medical doctor and better understanding of APN roles (COUTCOME2) as an outcome of developing APNs mentioned by another professional (engineer). Outcomes relating to the perceived value of the APN were the least mentioned by participants (34%).

Perceived barriers and facilitators in APN development

The relationship between participants and perceived barriers (Figure 4) and facilitators (Figure 5) in APN development was widely raised. Some 18 barrier-related nodes and 17 facilitator-related nodes were mapped with an average of 4.17 and 3.12 per participant, respectively.

Inter-professional opposition (CBARRIER13) showed the greatest associations with participants (15 participant ties) and centrality within the theme-related nodes. The theme was related to inter-professional opposition to the development of the APN roles by other professionals such as doctors, nutritionists and their own nursing unions. This theme presented the largest, uncontested barrier to the development of the role followed by the lack of legal framework (CBARRIER5), inertia of the profession itself/resistance to change (CBARRIER3) and the lack of understanding of the need for the role (CBARRIER6). These significant themes were surrounded by participants with nursing roles indicating uniformity of opinions on the main barrier-related nodes. The limitation regarding expression of the role (CBARRIER11) appeared interconnected only with managerial roles while training (CBARRIER) and financial (CBARRIER) themes appeared distant and hardly associated in the graph. Patient opposition appeared to have no

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connection with the main cluster of nodes indicating no consensus within participants' opinions.

Furthermore, the participants' relationship with facilitators graph showed a more extended network with hardly any clusters or patterns. Role autonomy and scope of practice definition (CFACILITATOR12) was the largest node (occurrence 6) and more balanced within the network although no clusters of professional roles or disciplines were associated with it. Three facilitator-related nodes appeared closely adjacent to each other, development and promotion of the role (CFACILITATOR4), self-confidence and increased knowledge (CFACILITATOR14), and political and organizational drive/vision for the development of the role (CFACILITATOR10). Understanding among nurses (CFACILITATOR16) and inter-professional collaboration (CFACILITATOR7) were the nodes with least occurrence and consensus on the graph.

Discussion

The study further analyzed qualitative narrative with a relational method to complement and better understand evidence from primary research. The NA shed further light on the structure of relationships connecting contextual factors in the development of APN roles and allowing visual assessment of convergence between participants and contextual themes. In the process, not all the participant demographics were retained and some information was lost but by using the method suggested by Contrandriopoulos et al. (2017) to associate multiple nodes, the study was able to retain and inter-connect multiple and complex relationships between participants´ ideas, preferences and opinions. Visual representation of the network of contextual factors and participants involved in the development of APN facilitated dimensional analysis and interpretation. The force-directed visual optimization algorithm facilitated the reading of the complex, dense network by integrating the quantitative indicators of node, tie, and network characteristics in the main network. This new knowledge could contribute to currently deficient context analysis in the implementation of new nursing interventions or nursing roles (Pfadenhauer et al., 2017) and increase the capacity to measure, document and strategize contextual factors that affect practice. This project uses participants from distinct contexts to get them involved in the public debate on understanding of APN, felt needs, perceived outcomes, and barriers and facilitators in role development.

The main network was formed around the contextual factors of understanding of the role, and needs and barriers, while perceptions of role outcomes and facilitators for role development were less frequently mentioned by participants involved in the development of the role. A search of the available literature revealed no other research that underlined which factors are viewed as the most important for key stakeholders and other people involved in APN role development.

Within the understanding of the role, agreement was found regarding core role skills, competences and qualifications. It is interesting to note that aspects mentioned by participants from all levels (local, organizational and environmental) and for all types of professions are in agreement with the international definition of APN (ICN, 2009) while patient management found no mutual understanding on the definition, possibly due to lack of formal implementation of the role. The added value and needs found in the study were also supported by the literature, which described the importance of APN roles in increasing the efficiency and sustainability of health services (Bryant-Lukosius et al., 2015). Outcomes did not appear to interrelate or cluster among participants, which indicates that agreement was not reached among participants on the perceived outcomes by APN development within the context of study. Although many participants insisted on differences in points of view between nurses and doctors, and between local and wider environmental levels, it is interesting to note that the topics raised were supported by other studies, including quality of care, efficacy, enhanced transitional care and accessibility (Sangster-Gormley et al., 2013). Barriers and facilitators in role development have previously been described in the literature with respect to different contexts (Casey et al., 2017; Kilpatrick et al., 2012) although the study provides further insight into the most significant and consensual themes in the study context, which was seen in previous primary analyses. Lack of understanding of the role, inertia within the profession, inter-professional opposition and lack of legal framework were the most concurrent themes, as seen in the literature. Recognition and regulation of the role, and supportive managers with drive and vision with regard to professional development were the main facilitators among participants. Much of the literature highlights the importance of these contextual factors to facilitate or impede the implementation of recommendations although studies rarely undertake a systematic analysis of the contextual structure underlying production and use of

knowledge at the local level (Estabrooks et al. 2003). Understanding the contextual factors and participants' interactions with context (Howarth et al., 2016) could influence the development and implementation of APN roles, and will ultimately allow better understanding of the extent to which the effect of APN can be observed in different settings, allowing further analysis of and support for innovative APN roles.

The results of this study have the potential to contribute significantly to analysis of the context characterizing the transferability and development of APN roles and assess the plausibility of previous data analyses. The optimized network revealed a high degree of relationships among the different disciplines regarding understanding and needs of APN. On the other hand, results showed no consensus on facilitators that support role development. Overall, the study empirically demonstrated associations or opposition among participants and contextual factors based on *a priori* group definitions, professional disciplines or roles. Further reporting of contextual factors that influence the development and implementation of advanced practice nursing roles in other countries is required to compare innovative processes.

Limitations

This study has some limitations. First of all, visual analysis is somewhat subjective and imperfect. The nature of visual optimization algorithms can change the position of the nodes and their significance. However, the study assists with the convergence and divergence of participants' perceptions. Comparing primary qualitative analysis findings against network information will enrich the overall analysis of data. Secondly, contextual themes were extracted from primary qualitative analysis and researchers' interpretations so the quality of the coding and thematic content analysis could affect the essence of context-related nodes and participants' associations. Finally, the data-collection process presented here as undertaken in focus groups does not preclude the limitations and biases that focus group research entails, such as covering maximum depth in a particular issue or moderator bias.

<div align="center">Conclusion</div>

The development and the introduction of APN roles in a specific health care setting represents a paradigm shift for nurses, physicians and other health care

workers. Understanding the contextual factors that influence the development and implementation of APN roles will ultimately allow better understanding of what it is understood by APNs, felt needs for the role and perceived outcomes of role development. This study provides a visual map of the structure of relationships connecting contextual factors in APN development in Catalonia and has expanded our understanding of the context in which the development process takes place, including participants' interactions. It has also raised the issue of barriers and facilitators that these roles have in their local context. This study contributes to understanding of the structure of relationships from contextual factors and participants involved in the development of APN. Gaining a better understanding of efficient and thorough ways to describe, assess and measure complex contextual characteristics is important in the continued development of greater knowledge about what affects APN role development and implementation so that local contexts can be better informed.

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Figure 1: Contextual Network in APN development

Figure 2: Network Context Factors 1
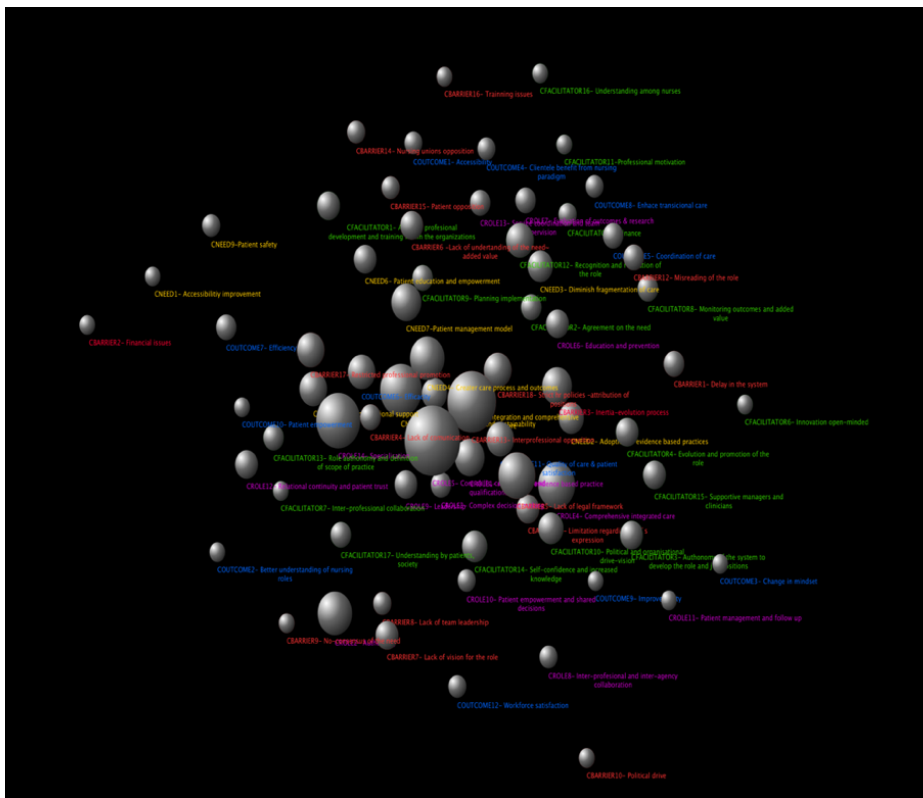
Figure 3: Perceived Needs and Outcomes of APN development
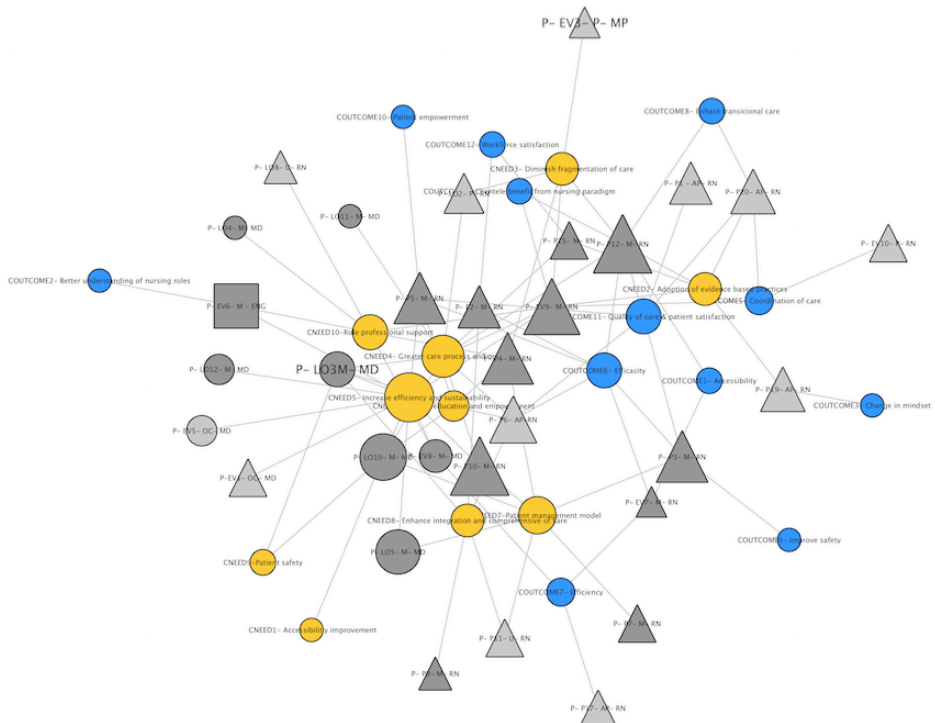
Figure 4: Perceived Barriers to APN development
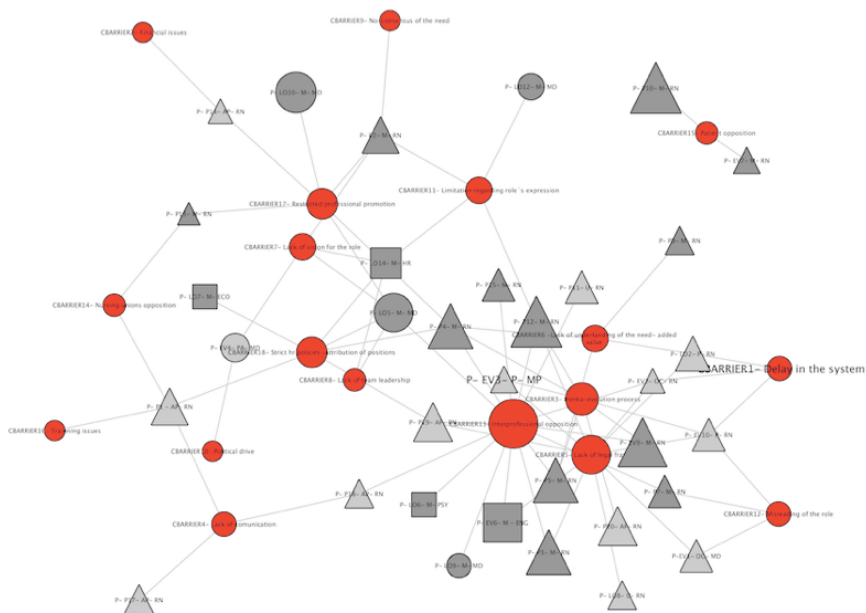
Figure 5: Perceived Facilitators for APN development
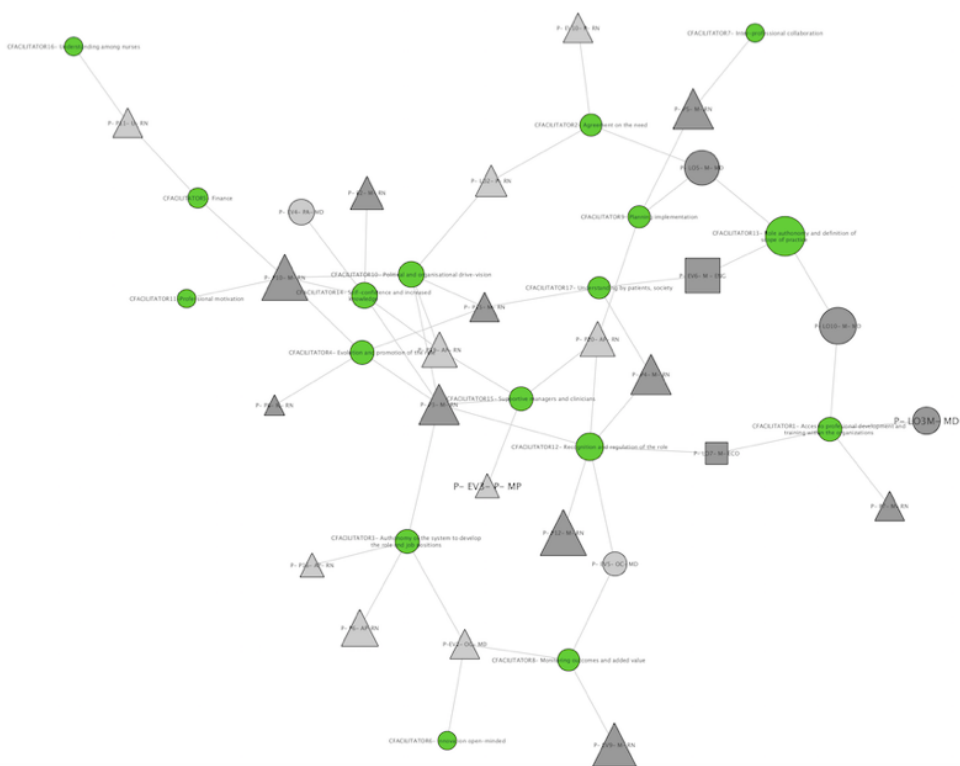
9. ARTICLE 5

"Context and implementation of advanced nursing practice in two countries, an exploratory qualitative comparative study."

Under review Nurse Education Today.

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Quartile 1: Nursing

Context and implementation of advanced nursing practice in two countries; an exploratory qualitative comparative study.

Abstract

Background: The complexity and difficulties involved in the development and implementation of health innovations, such as advanced practice nursing roles, result in slow and sporadic international acceptance. To manage this complexity, it is advisable to deepen understanding of the context in which these innovation processes take place. However, there is little research specifically concerned with contextual factors that influence the implementation of advanced practice nursing roles. **Objective**: to integrate results and develop a comprehensive understanding of the contextual factors that inter-influence the development and implementation of Advanced Practice Nursing in two countries, Canada and Spain. **Method**: The research method used was qualitative, descriptive and explanatory. Different qualitative methods, a novel data-collection process and perspectives from participants in various professional groups were used to triangulate the findings from both settings. Participants with diverse perspectives on practice, organization and health and regulatory environments were engaged to participate in semi-structured focus groups in Catalonia and individual interviews in Quebec. Data gathered aimed to provide information on a variety of context dimensions: (1) Perception/understanding of Advanced Practice Nursing; (2) Felt needs or motivations to develop the role; and (3) Perceived barriers and facilitators present in the Catalan and Quebec contexts at the external, organizational and team level. **Results:** a total of 30 interviews were conducted in Quebec and 44 in Catalonia. Integration of findings reflected a vast predominance of convergent themes despite differences in context and population characteristics. The study identified common and divergent contextual factors in advanced practice development and implementation in these settings. The same perceived barriers and facilitators were prominent almost evenly across all groups, although organizational and environmental themes were the most coded and discussed during the interviews.

Discussion: Understanding contextual factors will ultimately allow better understanding of complex phenomena in healthcare. To enhance implementation processes and knowledge transfer, it is essential to understand contextualized health innovations. Further reporting of contextual factors that influence the development

and implementation of advanced practice nursing roles in other countries is required to compare innovative processes.

Main Text

Greater life expectancy and advances in science and technology have affected the nature and the prevalence of illnesses and conditions, increasing complexity in healthcare organizations and patient care (Bergman, Hellström, Lifvergren, & Gustavsson, 2015). The pressing nature of current population health needs suggests that changes in healthcare delivery are desirable and unavoidable. To respond to these compelling challenges, some healthcare systems have attempted to find innovative solutions to health delivery issues, such as the expansion of professional roles (Archibald & Fraser, 2013). Optimizing the scope of professional practice to allow human resources to be used to their full potential will, ultimately, sustain the dynamics of intricate health organizations and meet population needs. The expansion of professional roles, such as advanced practice nurses (APNs), has emerged as an innovative solution in pioneering health care reforms. Two recent studies (Barton, Bevan & Mooney, 2012; Flynn, Scott, Rotter & Hartfield, 2017) classify the large number of reported inefficiencies in health care systems and suggest healthcare quality improvement through the establishment of advanced nursing roles. However, the suitability of APN as a complex intervention relies upon appropriate development and implementation in a specific context which reflects aspects of the target population (Pfadenhauer et al., 2017). Medical Research Council (MRC) (2008) guidance recommends that greater attention be paid to the contexts in which newly-developed interventions take place to identify contextual factors associated with differences in outcomes. The guidance suggests that interventions may work best if they are tailored to local contexts rather than completely standardized (Craig et al., 2008). The need to understand the contextual factors that influence activity and outcomes is well recognized, yet the role that context plays in the development and implementation of health and social care interventions remains poorly understood (Dowling, Beauchesne, Farrelly, & Murphy, 2013; Howarth et al., 2016). There is no real understanding of how knowledge acquired in one country can be translated and adapted to be useful in other countries (Dowling et al., 2013). Studies rarely undertake systematic analyses of the contextual structure that underlies the

production and use of original interventions (Pinto, 2015). Efforts to assess and measure contextual characteristics are made but are often limited in their ability to describe complex and varied circumstances surrounding the implementation of new knowledge or new nursing roles (Pinto, 2015).

Innovation processes and complex interventions such as APN-role implementation need a deep understanding of the theoretical foundations that underlie them and explain their capacity to produce an effect or not. From this standpoint, the APN context may become a major determinant of a result that could be affected by local laws, governance and education requirements (Contandriopoulos et al., 2017). Comparing settings/contexts and exploring APN´s capacity to produce, in the new setting, the same effects as were produced in the first would support adaptation to the new roles that best suited the new context and also support the transfer and any modifications that might be required (Craig et al., 2008). It would thereby foster a closer connection between research and planning for innovative and effective APN interventions carried out globally. Deeper understanding of the conceptual underpinnings of the interactions between contexts and interventions (Howarth et al., 2016) will allow analysis of how the problem of interest arises and is maintained in a particular community, organization or system (Hawe, Shiell, & Riley, 2004). Research studies have been conducted describing context in complex interventions although there are no studies that compare the context of APN implementation across countries. To overcome these difficulties, examination of how these roles are implemented in their practice context (Andregård & Jangland, 2014) and how contextual factors interact in distinct settings have been proposed. The study aimed to gain insight into the context that goes beyond borders by developing a comprehensive understanding of the contextual factors that influence the development and implementation of APN in two countries; Canada and Spain.

Background

The challenges of the current context are important for the development of healthcare systems (Kaplan, 2010; Øvretveit, 2011) and the need to enhance coordination, continuity, access and health care funding is important enough to encourage innovative solutions among organizations. Nurses, as the largest

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providers of direct patient care by numbers, are well-placed to improve quality standards in clinical practice (Bergman et al., 2015). The Institute of Medicine (Institute of Medicine, 2011) and the International Council of Nurses (ICN) (Bryant-Lukosius et al., 2017) acknowledged the importance of nurses leading services in transforming organizations to fulfil the needs of current health care systems and contributing to achieving sustainable development goals set by the World Health Organization (United Nations General Assembly, 2015). The ICN defines the APN as a registered nurse with expert knowledge, complex decision-making skills, and the clinical competencies necessary for expanded practice (International council of nurse practitioner/Advanced practice nursing network, 2016) who has the capacity to take on more complex caseloads and manage them with greater autonomy, judgement and accountability. Thus, the APN is a pivotal human resource in the transformation of primary and specialist healthcare. The development and implementation of APN roles affect health care delivery, organization, management, workforce planning, policy and research outcomes, while the literature shows that patients are satisfied with the services offered by various advanced nursing roles (Delamaire & Lafortune, 2010). In addition, research reveals improvements in access to services, along with reduced waiting times and improvements in collaborative practices with distinct conditions and settings such as acute care (Kilpatrick et al., 2012), long-term care (Donald et al., 2013), rural service provision (Roots & MacDonald, 2014), first-line services (Quinlan & Robertson, 2013), and even emergency services (Jennings, Clifford, Fox, O'Connell, & Gardner, 2015). There is also evidence indicating that APN roles and services could be cost-effective (Bauer, 2010; Bryant-Lukosius et al., 2015; Martin-Misener et al., 2015) although more research is needed in this area. Nonetheless, there is strong consensus on the difficulties associated with the implementation of different types of APN roles and the APN concept can vary greatly from one country to another and even from one region to another within the same country. An analysis of studies from 18 countries identified 14 separate APN job titles (Dowling et al., 2013). Introducing and implementing APN roles in public healthcare organizations is described as a long, difficult and complex process (Contandriopoulos et al., 2016; Andregård & Jangland, 2014; Sangster-Gormley, 2013). Internationally, there is no real understanding of how to go about

introducing APN in context-specific healthcare systems and how best to transfer knowledge and implement new roles according to context. Difficulties encountered in the implementation process could have serious consequences for populations, professionals and health service systems (Archibald & Fraser, 2013) and reduce the potential benefits of expanding the scope of nursing practice (Archibald & Fraser, 2013). The complexity associated with the implementation of APN roles means that in jurisdictions such as Quebec (Canada) and in several areas of the world, including Catalonia (Spain), the introduction of these nursing roles remains sporadic and dependent on the fluctuations of political programs (Contandriopoulos et al., 2016; Dicenso & Bryant-Lukosius, 2010). Although there is a body of evidence to support APN implementation, the full potential of these innovative roles can only be achieved if their introduction and implementation is complete and successful (Liego, Loomis, Van Leuven & Dragoo, 2014).

Evaluation of contextual factors is key to the successful transfer of knowledge and implementation of new roles and interventions (Kaplan, 2010). Identifying distinct contextual dimensions that influence development and implementation of APN roles may support organizations in creating environments that facilitate the use of evidence in nursing practice to improve their outcomes. These could be relevant to healthcare organizations internationally that have long struggled with how to analyze the parameters that can influence the development and implementation of APN as a complex intervention. Spain and Canada share common concerns about the reforms and organization of health systems, such as the issues of coordination, continuity, access and financing of health care that affect a number of countries. In addition, the Catalan and Quebec health systems have sufficient common ground for solutions to challenges to be sources of two-way inspiration (Dedeu, 2010) and to distinguish differing dimensions of the same phenomenon. The formal introduction of new roles associated with APN has been recommended in Quebec since the 2000s (Clair et al., 2000). Increasing the availability of advanced practice nurses is a strategy that has been included in many Quebec Ministry of Health and Social Services plans (Ministère de la Santé et des Services sociaux, 2017). However, the implementation of this type of practice in Quebec is slow and fragmented (Lapointe, D'anjou, Durand, &

Laflamme, 2009). Similarly, implementing the transformations of Catalan government programs in Catalonia, guided by the Catalan Health Plan 2016-2020, has created alternative models of care that require new nursing mandates (Health, 2016) despite formal recognition of APN roles. Currently in Catalonia, several pilot projects are being developed which try to implement APN in the areas of primary and specialist care. Highly-trained, expert nursing professionals bring innovative practice profiles and a more extended service portfolio than a general nurse in Spain. Recent studies showed the extent and patterns of advanced practice activity in newly developing nursing roles and the potential benefits that these roles bring to their practice (Fabrellas et al., 2011; Morilla-Herrera et al., 2016).

Conceptual Framework

This study uses a Framework of Contextual Factors inspired by Tomoaia-Cotisel et al. (2013) for reporting relevant context in research studies (Figure 1). The framework supports the reporting of relevant context for complex phenomena and is used as a guide to interpret interactions and the development of processes and outcomes. It classifies the most important contextual factors into five specific domains: (1) the practice setting, (2) the larger organization, (3) the external environment and cross-cutting themes: (4) implementation pathway, and (5) the motivation for implementation. To understand context, identification of distinct data resources from multiple levels and systems is recommended. These recommendations demonstrate that involving diverse participants at multiple stages of implementation and consistently reporting critical contextual factors are important challenges for professionals interested in improving the internal and external validity and impact of health care research.

Methodology

Aim

This study aimed to explore and integrate the contextual factors that inter-influence the development and implementation of Advanced Practice Nursing in two countries; Canada and Spain.

The study specifically explored (1) the perception/understanding of APN, (2) felt needs and motivations to develop APN, (4) perceived added value/outcomes of APN and (4) perceived barriers and facilitators present in the Quebec (Canada) and Catalonia (Spain) contexts at the external, organizational and practice level.

Study Design

A qualitative, descriptive design (Sandelowski, 2000) involving triangulation analysis was selected to explore and compare contextual factors in two different areas. Considering the current lack of knowledge on the subject, the research method used was explanatory (Paillé & Mucchielli, 2009). Qualitative data provide a good understanding of how the implementation of interventions develops over time and such a trend line can further generate practical action rules and relevant managerial wisdom (Landau & Drori, 2008).

This study is a secondary analysis of a case study in Quebec and a qualitative, descriptive study in Catalonia. In Quebec, the team carried out an implementation study using a case-study research design in three health regions where initial data collection was conducted through individual semi-structured interviews. At the Catalan site, semi-structured focus groups were formed to explore the research questions.

To shed light on a phenomenon such as APN, the use of multiple methods and data sources to help facilitate deeper understanding is recommended (Angen, 2000). A triangulation analysis of the varying qualitative approaches, collection procedures and data sources was performed to contrast the extent to which evidence of contextual factors converged or provided unique contributions in both study regions. The use of triangulation (Patton, 1999) of methods, procedures, investigators, subjects and settings allowed cross-checking and examination of the consistency of results on the development and implementation of APN.

Subjects and Setting

Recruitment was done by purposive sampling at the Quebec and Catalan sites, establishing potential actors to be interviewed a priori. As reaching a comprehensive understanding of the emergence of an innovation, such as the implementation of new nursing roles, requires multi-level analysis among the various actors and levels (Pfadenhauer et al., 2015), various types of participants

were recruited. At both the Quebec and Catalan sites, participants were mainly employed in a field that was directly or indirectly linked to the process of development and implementation of APN. Participants were selected because they were viewed as able to inform about one or more of the multiple dimensions of the Catalonia or Quebec context: political, cultural, educational, organizational, professional and/or population, and able to maximize the variety of responses coming from diverse environments or organizations.

In Quebec specifically, potential participants were identified (n=27) in collaboration with the Quebec Ministry of Health and the relevant regional health and social service agencies. Selection was based on two criteria. The first was to be part of a team where a Nurse Practitioner (NP), a type of APN, or RN with an extended scope of practice had been successfully integrated. The second criterion was to maximize the variation of the organizational framework (public, community organizations, and publicly-funded medical organizations, suburban and urban) and the stage of integration within the team. Semi-structured interviews were carried out with members of clinical teams and local managers.

In Catalonia, the participants (n=44) also aimed to represent diverse team members involved with APN implementation and significant key stakeholders at a variety of contextual levels: practice, larger organizations and external environment. Participants in Catalonia were recruited from distinct levels to collect information on experiences from clinicians and managers that help shape the practice environment, and other actors outside the organizational environment such as those in the political, marketing, financial and educational spheres, along with views on coordination between levels of care.

Data Analysis

Data collection from participants at both sites was conducted between March 2014 and December 2016. Data were recorded and transcribed at both sites and analyzed following multiple stages to achieve thematic analysis and triangulation of data at both sites.

The first stage in thematic analysis carried out was based on the theoretical proposals from the Framework of Contextual Factors (Paillé & Mucchielli, 2009). Secondary data analysis was used in Quebec as it allows to us to tap into existing

resources (Squires et al., 2015). The codified database was analyzed according to the study objectives; the perception of the APN role; and the motivation for implementation and facilitators and barriers to implementation. The Quebec project was a combination of logical analysis and implementation analysis. At the operational level, the research team initially carried out a logical analysis of deployment and advanced nurse practice based on a realistic review of the literature and expert advice. This iterative analysis revealed the structural characteristics and processes of functioning primary care teams based on expanded nursing roles. Second, the team carried out an implementation analysis using a case-study research model (n=6) in three health regions in Quebec. Each case was defined as a clinical team in Quebec in which one or more expanded NP or RN roles were integrated. Analysis of the same intervention in various contexts improved the external validity of results. The case study data were primarily based on semi-structured interviews with members of clinical teams and other key stakeholders such as the Chief Nursing Officer or local services managers. In total, 20 individual interviews and 3 group interviews were conducted. The interviews were audio recorded and codified with QDA software. The codified database was analyzed (2,940 verbatim responses) according to the themes that emerged from the Barcelona data analysis: perception of the APN role; the motivation for implementation; facilitators and barriers to the implementation process; the type of patient management chosen; and support from management staff.

In Catalonia, semi-structured interview guides were developed, validated and applied by the researchers at both sites based on the reference framework. Focus groups were designed distinguishing between groups of clinicians, actors involved in management in a University and Community Hospital in Catalonia and participants from the wider academic, political and decision-making setting. Following the group interviews, in-situ manual categorization of data and theme-creation was carried out. The manual categorization of data was done by two researchers from each site conducting the focus groups using recorded audio data and notes. This step was followed by re-validation of recorded data and re-validation with the researchers. Following initial categorization analysis, results were shared with the participants in the Catalan context although conclusions

were not drawn before the data were fully analysed. As a second step in analysis, data analysis software NVIVO 11 was used to code focus-group data, exploring conceptual relationships and counting key words. Data analysis with software in Quebec and Catalonia facilitated identification of patterns and established relationships from complex data. Credibility was achieved at both sites by reading each transcript, coding the data into basic themes at both sites by the same researchers and finally into a coding frame where all the data at both studies were accounted for in similarity of content and substance, thereby demonstrating internal consistency (Silverman, 1995).

The second stage, triangulation of data, was conducted with the findings of the thematic analysis performed in Quebec and Catalonia. The multi-stage analysis helped with the reciprocal transfer of data between studies and in finding commonalities and translation of one study's findings into another, using concepts and themes that diverge or applied to both. The Triangulation Protocol for health research studies was used to assist with the integration of data (Farmer, Robinson, Elliott, & Eyles, 2006). Researchers from both sites applied the triangulation protocol by (1) identifying unified sets of themes from the reference framework, (2) converging the themes and data set into a coding matrix, (3) analyzing the findings, (4) comparing the integration and (5) providing further feedback. Dependability was enhanced by the use of the Framework of Contextual Factors as a topic guide (Tomoaia-Cotisel et al., 2013), confining the final analysis to two members of the research team and using the coding matrix to display findings, followed by consideration of whether there was agreement (convergence) or contradiction (dissonance) of findings, complementary information on the same topic (complementarity), or data arising from one data set and not the other (silence) (O'Cathain, Murphy, & Nicholl, 2010).

Ethical Consideration

Ethics committee approval was obtained from the relevant local ethics committee in Quebec (#14-141-CERES-P and MM-CODIM-FP-16-112) and Catalonia (Exp #HCB/2014/0811). Potential participants were asked, prior to inclusion, whether they would agree to take part. The participants were not paid, nor did they receive any other kind of compensation. No minors or patients were included. Participants

were assured of the anonymity of their responses in the findings report and research analysis. People who returned the signed inform consent form indicated their consent to participate in the study.

Results

Demographic characteristics

In Quebec, 23 individual or group interviews were conducted with 27 participants. Most were female (78%) and the majority had a high educational qualifications such as a master's Degree (33%) or a PhD (26%). All primary health care organizational structures were represented, with 5 participants from community-based non-profit organizations and 23 from the public sector, divided into a family-medicine group (private medical clinics where public hospitals cover nurses' salaries in exchange for the clinic extending its opening hours and increased care continuity), local health and services centers (public organizations providing primary health care and social services) and hospital-based family-medicine units which train medical residents and nursing students. All of our participants were based in urban or suburban areas. In Catalonia, a total of 44 participants were interviewed with a response rate of 86.5%. Four semi-guided group interviews were conducted in March 2016 with 1) clinicians, mainly consisting of nurses that carry out advanced practices and managers of different services who were in direct contact with everyday practice 2) managers and actors involved in management within the hospital organization, and 3) participants from academic, political and decision-making circles. Participants ranged in age from 20 to over 70 years old. Those aged 50 to 59 years old were most represented, making up 53% of the total. Most were female (68%) and the vast majority had a high educational qualifications such as a master's degree (59%) or a PhD (32%). All participants were employed directly or indirectly in the process of developing or implementing APN roles in diverse disciplines including nursing (62%), medicine (27%), Human Resources (2%), midwifery (2%), psychology (2%) or others including university professors or an economist. Some 84% represented the public sector with the other 16% representing private, non-profit or sole trader organizations. A wide range of practice settings were represented with 29

participants based in the hospital setting, 5 in the community, 4 in secondary care and academia and 2 at other health care providers. A total of 84% of participants were based in a metropolitan urban area with none working in rural or remote regions.

The multiple themes and data sets integrated in a convergence coding matrix of findings from each theme can be seen in Table 1. The matrix integrated the two sets of results on the essence of the meaning and prominence of themes presented (Farmer et al, 2006). The matrix allowed determination of the degree of data convergence and integration within the findings.

Understanding of Advanced Nursing Practice

A broad range of views came to light on the perception and understanding of APN roles. Interview data showed common themes on the type of nurse, along with role competences, functions, structures and processes. In both areas there was agreement on role definition with a view that the APN has greater autonomy, in-depth knowledge, high capacities when dealing with the complex needs of a specific population or group and evidence-based- practice. Participants reflected the high degree of health specialization and the combination of clinical and non-clinical skills focused on comprehensive patient care to describe their perception of the role. Some of the most frequent themes concerned patient management, education and prevention, and improved relational continuity with the patient. Participants' opinions converged with regard to understanding of the importance of the extended scope of practice in advanced health science and techniques although there was common agreement at both sites on the importance of having a master's in social science, which leads to greater patient trust.

"The ability to promote self-care and share decisions with the patient - usually requires time and dedication that other general nurses do not have - by providing a closer relationship and full confidence with the patient"

Participants expressed the view that, in practice, APNs had a very important role at the social level by dealing with areas including the role of the patient, family, culture, motivation and development process. These skills were considered to be

valuable in problem-solving and meeting the expectations of patients, backed by specialized scientific knowledge. Inter-professional and inter-agency cooperation was viewed as an opportunity to share care responsibilities with other professionals. The APN was seen as most suitable person to supervise and coordinate team efforts due to the continuous care provided, closeness to the patient and comprehensive view of the patients and their circumstances. Most APNs saw themselves as leaders in broadening the scope of nursing practice and other participants at the organizational and environmental levels suggested that these innovative roles should involve leadership skills and competences to be able to influence change management and establishment of roles.

"Regarding clinical practice, APNs are in a privileged position to be main points of contact and leaders within the service"

There were some silent data that could not be translated from the findings of one study into another. For instance, those at the Quebec site appeared to be more involved in discussions about prescription and therapeutic adjustments as well as the role of APNs in evaluation, examination and discharge. These concepts could not be considered at the Catalan site, which focused more on discussions about core skills, competences, qualifications and the evaluation of outcomes and research as part of APN practice. The subject of role specialization had distinct complementary information in each setting. As specialist roles have already been implemented in Quebec, understanding of the role was clearer than in Catalonia.

Motivations for role development

The two sites found common ground and converged on the need to implement and develop APN roles to increase support for other health professionals, improve accessibility to health services and promote change in patient management models. In many cases, advanced practices appeared to be implemented to improve accessibility and the comprehensiveness of patient care; improve access for new-borns, and more tailored care for mental health disorders or palliative care. Patients' needs were broad enough for nursing practice to develop and become more autonomous within an integrated team in primary and secondary care. The relational continuity between nurses and patients was seen

as necessarily less linear because of the narrower scope of practice and full role implementation process. Referring to other professionals and follow-up was identified as a need to mitigate relational discontinuity.

Clinicians, managers and participants from the wider environment recognized that, generally, APNs allow improvements in efficacy by allowing physicians to enrol more patients, shorten waiting lists or be more reactive in complex cases. This improvement was concomitant with changes in service organization such as the arrangement of appointments and follow-ups.

"Midwives coordinate all women's health. They have increased the quality of care of the patient, decreased admissions, increased savings and developed a change in the philosophy of care."

"APNs, sometimes they have been cost-effective and sometimes they have cost more but it has always increased the quality of patient care, quality of services and service organization. As we review the process and develop re-structuring, we make the process more efficient"

Convergent data showed that the role allowed for more interdisciplinary work where participants emphasized greater exchange of knowledge, patient flow and team support. There was a view that there was less solo or parallel practice and expertise was better integrated in an improved "working atmosphere".

"…Increased continuation of services has been seen following the introduction of APNs. We are sharing patient care with different levels of care and standardizing the care among these levels"

There was also agreement on the need to transform evidence into practice and to have "better links between research and practice" by having leading professionals that can generate protocols, transform knowledge into clinical guidelines and disseminate results among their peers. This was viewed as a change in the nursing paradigm which benefits patients. The complexity of the

population was seen as a major driver for nurses to develop higher competences, abilities and autonomy to meet current health demands.

"The needs are those of the patient; the characteristics of the patients that we have nowadays in acute and chronic services. The need for the organizations to give solutions for care of these patients"

Other similarities in the datasets were discussed, such as the improvement in outcomes by APNs, better understanding of nursing roles and the change in professional mind-set. Organizations have seen more consistency in the use of collaboration and team management. The need to understand the new developing roles by other professionals and patients was key to satisfactory team organization.

Other specific needs arising solely in Quebec or Catalonia were categorized as silent in the coding matrix. These included the need to integrate marginalized clientele in Quebec or the need for patient safety, less care fragmentation or more efficient care processes and outcomes in Catalonia. There were no complementary or dissonant themes regarding motivation for role development.

Felt needs/outcomes for role development

Perceived role outcomes mostly converged within the data sets. Accessibility, efficacy and efficiency were prominent and had the same meaning at both sites. Respondents were clear on the importance of improving process and health outcomes for further development and implementation of APN roles. Reconsideration and restructuring of care processes were necessary steps in prioritizing patients over organizations and developing quality services. The benefits of the nursing paradigm combined with the interdisciplinary collaboration were in common agreement as an added value of the APN role.

"I will work in a more patient-centred organization with an integrated care service. APNs should not be seen as competing for physician roles but rather as professionals that can work in full partnership. It is different in itself and it has value for both…re-define!"

Data on APN roles were agreed to make processes more efficient by increasing exchange, patient flow and team collaboration as necessary outcomes in transforming "solo" practice, as well as joint expertise and better organization within organizations and levels of care.

"At the organizational level, it has been a reorganization of professional functions. There has been a decrease in costs when there are decreased admissions or re-admissions and, at the patient level, there has been an increase in patient satisfaction and quality of life"

Enhancement of transitional care, care quality and patient empowerment/satisfaction were silent data in the Quebec analysis. Additionally, the fact that professional development leads to greater professional satisfaction was only emphasized at the Catalan site. Better understanding of nursing roles produced complementary sets of information as differing scope of practice and role definition depended on the area of analysis.

"The specific care and programs have helped to coordinate the progress of specific patients and increase the autonomy of nurses. The main impact is to improve the quality of care and the satisfaction of the team when looking after their patients"

Perceived barriers and facilitators

Themes discussed on perceived barriers to and facilitators of APN implementation are detailed in Table 2. There were numerous themes with common ground which were integrated into the data analyses at the three context levels; practice, organisation and environment, as well as in the implementation pathway. Issues related to barriers and facilitators were prominent almost evenly across practice, organization or environment levels, although the organization and environment level themes were the most coded and discussed during the interviews. Discussions on opposition to the roles by patients, other professionals or organizations were widely agreed upon both in meaning and prominence. It

was commonly held that, most of the time, openness and willingness of doctors to accept change could influence new nursing role integration. The vision that the physician alone is able to take care of the patient needs time to change. The transfer of care of a patient from a physician to an APN is challenging for relational continuity and can lead to professional or patient opposition. Also mentioned was the fear of jobs being lost or duplication of services. There was consensus that professional competition is a major barrier although many of the participants could see the benefits of defining boundaries and teamwork.

"What I see in practice, it's more a professional territorial definition challenge: "this is medical territory… you should not be allowed to do this..." If we agree that APNs are good for health practice and patients and that some people are able to do certain activities that they are trained for and they have the legal authority to do it, that's perfect. But I think this should be well defined"

"For me the principal barrier is other professionals. APNs perform certain interventions that are seen as professional intrusion, for example, from doctors or dieticians"

Complementary data on role opposition was found at the Catalan site, as nursing representatives and nursing unions could be seen as barriers to organizations recruiting talent externally. Although participants acknowledge understanding of the role and definition of APNs, when discussing practice barriers there was confusion over specific activities and boundaries between professions which lead to a misreading of the role and limitations to role expression. Participants at both sites also engaged in discussions on barriers related to the lack of available adapted academic training and insufficient emphasis placed on clinical judgement and physical and mental assessment. Continuous education and professional development was seen as inadequate and difficult to integrate into clinical practice.

The lack of a legal framework, vision of the role and funding were silent data that could not be translated to the Quebec site and highlighted the specific limitations of the Catalan setting. The limitations were not only economic but were further

exacerbated within the nursing profession by restrictions in the labour market, the ability to acquire professionals' rights and labour policies that promote professional development. At the Quebec site, limitations were characterized by the organizational and technological limitations of the system which did not keep up with role implementation.

"I think the stakeholders in professional bodies, government, associations, department of health, universities and the groups of interest should be involved in the process of APN consensus and implementation. There should be a diagnosis about the need to implement these kinds of strategies and work together to implement the roles"

With regard to the facilitators, access to training, promotion of the role and understanding and acceptance of APN by others were seen as encouraging implementation and role development. Collaborative project developments, as well as role autonomy, played an important role in the discussions. There was common agreement at both sites that there are many nursing specialities and human resource optimization should be used to maximize their potential. In collaboration, nurses succeed well in balancing the care delivered, using both the principle of subsidiarity and the development of skills within subordinate roles, either by giving more autonomy to these nurses or by developing the informal acquisition of knowledge and expertise. Some commented that clinicians must rely on the principle that it is the patient´s situation that dictates which professional will be seen and not only with whom the patient is enrolled. When professionals understand what APNs can do, they are disposed to refer more complex patients to them and they argue that academic education does not sufficiently prepare professionals to understand each other's roles. When other professionals understand the roles, communication is faster as common vocabulary is acquired. Political motivations to develop the role were also examined, political drive and continuous turnover of managers, can negatively affect the vision for APN development. Managers and key stakeholders that show positive leadership and

have a vision of how the care model should be developed is seen as a main facilitator on the implementation pathway.

The right to prescribe, good communication and the type of clientele were not mentioned at the Catalan site, probably as the role is not fully implemented. Other issues, such as autonomy within the system to develop the role, monitor outcomes and regulate of the role were particular to the Catalan site. Access to professional development and training was the only theme that revealed contrasting views in the datasets. While one referred to the formal and informal acquisition of knowledge, the other focused on organizational efforts to train and develop staff internally rather than make APN positions accessible through to open recruitment processes. The silent and dissonant data sets were seen as functions of distinct populations and degree of implementation of the APN role.

Discussion

Much of the literature highlights the importance of contexts in facilitating or impeding the implementation of recommendations even though studies rarely undertake a systematic analysis of the contextual structure underlying the production and use of knowledge at the local level (Estabrooks, Squires, Cummings, Birdsell, & Norton, 2009) and even less frequently compare areas or countries of implementation. This study describes the contextual structure and perception of APN, the need for implementation and the barriers and facilitators involved in successful implementation in Quebec and Catalonia. A high degree of convergence was found across the sites and clinical areas with respect to identified role perceptions, needs, outcomes, and facilitators and barriers.. Regarding understanding of the role, autonomy, service coordination and inter-professional collaboration were the most prominent themes at both sites. Furthermore, barriers and facilitators findings suggest that numerous discussions covered common ground concerning clinical areas and the health system in general. The most common themes on barriers were role opposition by professionals, patients and nursing unions, as well as training issues, and lack of professional development and financial incentives. Facilitators that promote implementation included understanding and acceptance of APN by others, role autonomy, and supportive managers and key stakeholders. Identifying these points of convergence empirically builds upon what had been reported by some

authors (Nardi & Diallo, 2014) where similar issues were present in dissimilar countries. Some barriers to practice found in this research, namely prescribing authority and independent practice, echo almost exactly what had been shared at the international level (Fealy et al., 2015). Similar conclusions have also been published elsewhere (Sheer & Wong, 2008). These communalities are important in the sense that they may lead to greater international understanding of the APN roles implementation process as a whole and therefore to better informed global strategies.

Some topics were country-specific, as well as some themes regarding outcomes and motivation for APN development. For instance, the few facilitators identified varied substantially across countries. Views on access to professional development and training diverged as participants mentioned different realities in practice. There were some differences and silent data when comparing analyses at the study sites in terms of level of implementation and development of APN roles, although multiple commonalities and integration of data was found across countries. There are relatively few studies reporting on these variations between contexts despite being crucial to understanding why interventions succeed or fail (Benzer et al., 2013). Moreover, APN roles are flexible (Faith Donald & Alba, 2010) and complex innovations can be reinvented (Rogers, 2003) but it is important to understand the interaction between the needs and context. For instance, according to Brooten (2012), in "measuring outcomes of APN practice globally, it is critical to choose health outcomes or health services or system issues important in the country where the APNs practice". Furthermore, the context itself can bring about successful or unsuccessful results, for example in environments where the APN role is recognized and accepted, effectiveness can be demonstrated (Brooten et al., 2012). Divergent findings can lead to the generation of new theories and further exploration (Perlesz & Lindsay, 2003). Mays and Pope (2000) report that comprehensiveness may be a more realistic goal for the triangulation approach. Thus, apparent contradictions (or exceptions) do not pose a threat to findings but rather extend the scope for determining more precisely how one country or context of implementation differs from others.

The combined study results allow integration and understanding of the dynamics of the context in which the APN implementation process takes place. Experts in

the area often exacerbate this slippage by emphasizing internal validity, often at the expense of the contextual factors that make science relevant to practice (Green, Glasgow, Atkins, & Stange, 2009). It is important to explore the perceptions of the practice, organization and decision-maker community as essential parts of an open society that values truth and ideas over interests and preferences. This project uses participants from distinct contexts to get them involved in the public debate and to discuss their perspectives, influenced by various levels, settings and backgrounds. The study could attribute some of the deviant data to the many stages of formal recognition of the role and its activities, such as prescription and therapeutic adjustment, and admission/discharge rights which have not been recognized at the Catalan site. Specific needs and outcomes associated with APNs also reflect a vast predominance of common themes despite the differences in context and population characteristics. In Quebec, the lack of both nursing and medical staff has allowed the nurses in post to develop advanced practices to meet population needs, while in Catalonia there is a need to enhance integration and coordination between different care levels.

Implementation research that considers context is crucial when transferring a complex intervention such as an APN role from one setting to another to ensure, *a priori,* that the effects are the same. This triangulation process highlights the importance of exploring and understanding disagreements and silent themes that explain the purpose and nature of the data (Farmer et al., 2006). To our knowledge, this is the first study to interpret common and unique context analysis of APN development and implementation in two countries. Previous studies have considered specific barriers and facilitators across a number of countries (Puchalski Ritchie et al., 2016) with respect to APN (Casey et al.) although none has been conducted specifically on APN implementation within countries. The results of this project have the potential to contribute significantly to defining objectives and implementation, and assess the elements characterizing the transferability and implementation of APN roles in order to reduce problems that transcend national boundaries.

Limitations

This study has some limitations. First of all, secondary analysis was used in the Quebec site that may have failed to capture some of the questions under study, particularly those identified as outliers at the Catalan site. However, given that the authors of the present study contributed to both data collection and preparation of the reports for the primary studies, we believe it unlikely that any significant data were overlooked. Second, formal recognition and implementation at the Barcelona site has not yet occurred so any barriers and facilitators identified maybe perceived rather than demonstrated obstacles and enablers. Perhaps the overall results at the Catalan site will change if re-examined once the implementation process has taken place although the vast commonalities at distinct implementation stages could indicate that it will vary slightly. And third, although a broad range of participant and key stakeholders contributed to the findings, rural and remote areas were not represented. Nor were patients included. Despite the limitations of the context analysis, the study has highlighted the apparent importance to implementation of the involvement of stakeholders in discussions, decisions and training. Although further research is needed, the findings suggest that context analysis may reveal important commonalities in international areas of practice.

Conclusion

Understanding the contextual factors that influence development and implementation at the practice, organizational and environmental levels will ultimately allow better understanding of the extent to which the effect of APN can be observed in different settings, allowing analysis and support of innovative APN roles. The development and the introduction of APN roles in a specific health care setting represents a paradigm shift for patients, nurses, physicians and other health care workers. Better awareness of what it is understood by APN, as well as the needs, barriers and facilitators that these roles have in their local context allows more confident insight into the link between APN implementation dynamics and the political and social structures surrounding the role. The idea that APN contexts can converge and be combined in different analytical methods could further assist with development and implementation to allow improvement of

structures, processes and health outcomes. Cross-verification of results from two sources allows validation and better understanding of efficient and thorough ways to describe, assess and measure complex contextual characteristics if we intend to continue to develop greater international knowledge about what affects APN role development and implementation to better inform local contexts.

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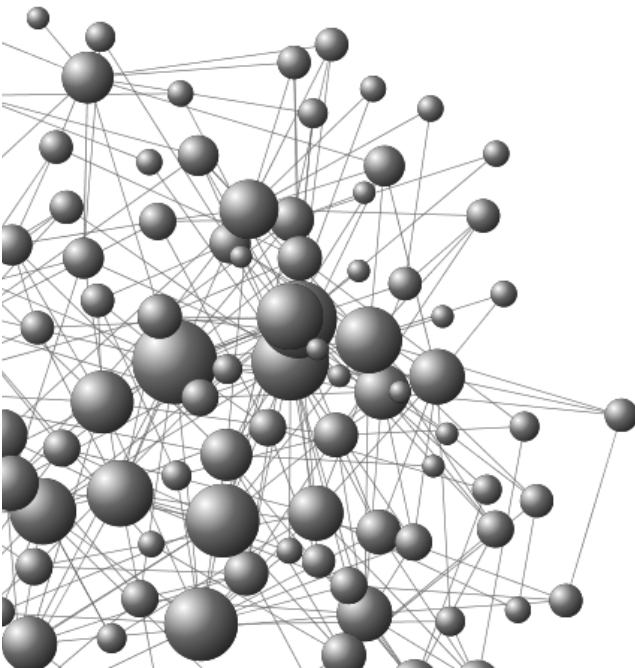
Table 1. Matrix of Findings for Contextual Factors

THEMES	CASE STUDY INTERVIEWS IN QUEBEC	FOCUS GROUPS IN CATALONIA	RELATIONSHIP
Understanding of Advanced Nursing Practice			
Prescription and Therapeutic Adjustment	Some prescription rights under collaborative guidelines for specific situations and conditions . Increased autonomy and greater number of visits.	-	Silence
Evaluation, examination and Discharge	Expanded competences in discharge, complex care and access to specialiced resources.	-	Silence
Teaching, Training and Student Supervision	Advisory clinical and managerial role. Mentorship with students and collegues (strategic meetings...)	-	Silence
Service Coordination and Team Supervision	Pivot role inside and outside the team. Main person of reference with patients and overview of interactions from other services.	Main point of contact for the team and collaborating service.	Convergence
Education and Prevention	Therapeutic education and couselling about prevention of complications and healthy living	Promotion of self-care, empowerment to the patient and lead in shared-decision with the patient	Convergence
Specialization	Traditional nursing specialised care vs integrated care	Expertise in process, condition or symptom. Specialist training and expertise in some areas.	Convergence Complementarity - Different specialisations in different settings
Patient Management and Follow up	Join management model of care in collaboration with General Practitioner. Voluntary partnership between General and Nurse Practitioners.	Expecific patient management in complex patietns requires multi-agency involvement and collaboration.	Convergence
Relational Continuity and Patient Trust	Trusting relationships between APNs and the patients/MDTs	Closer relationship with the patient. Non-technical skills like comunication skills and good relation with the patient, increasing quality in their interactions.	Convergence
Inter-Professional and Inter-Agency Collaboration	Increased comprehensive and integrative care through collaboration.	Ability to collaborate with other professionals involved in the patient care.	Convergence
Leadership	No leverage to influence practice in medical clinics. Legal limitations. Leadership to broad scope of practice.	Referent and leader within the multidisciplinary team. Expert lobby in specific areas of care to expand practice.	Convergence
Complex Decision Making	-	Capabilities to perform complex interventions and monitor results	Silence
Adoption of Evidence Based Practice	-	Ability to apply ut to date research results and knowledge to their practice.	Silence
Comprehensive Integrated Care	-	Global view of patient process	Silence
Core Skills, Competences and Qualifications	-	Main definitory carachteristics of APNs	Silence
Authonomy	-	Professional autonomy in activities, decisions and functions to facilitate care. Higher responsability and accountability in their tasks.	Silence
Evaluaion of outcomes and research	-	Evaluation of health and process outcomes to determine role impact.	Silence
Motivations for Role Development			
Auto-Determination	Participation in decision-making processes, assesments of practice and quality improvement involvement.	-	Silence
Marginalised Clientele	Role development due to lack of medical services or specialised follow up in certain population groups	-	Silence
Accessibility Improvement	Need to increased caseload, reduce waiting lists or to be more reactive in the way appointments are made.	Decreased waiting list, closer follow ups for patients that most needed.	Convergence
Role Professional Support	Supporting other professionals in practice	Team support and regulation. Access to professional development within the team.	Convergence
Patient Management Model	Improve accessibility, integration and comprehensiviness of patient care. Linear relational continuity with patients, aboiding gaps between levels of care. Diminish fragmentation of care.	Needs of the own patientswithin acute and chronic services.Re-think organisations to give solutions and improve connections between primary and secondary care. Nursing case management. Integration of care.	Convergence
Patient Safety	-	Increasing patient safety to improve gloval resources in specific areas ei. anesthesia nurses	Silence
Greater Care Process and Outcomes	-	Economic advantage and sustainability, patient satisfaction, decreased re-admissions, improved patient and process outcomes and quality of care.	Silence
Adoption of Evidence Based Practices	-	Translational care based on research, experience and knowledge.	Silence
Patient Education and Empowerment	-	Doctors and general nurses do not have the sufficient time to dedicate at patient education and empowermet in specific cases.	Silence
Percibed Role Outcomes			
Accessibility	Reduce waiting lists, increased number of patients enrolled in practice for certain specific or vulnerable patients. Increase availability of time slots. Ensure transmission of information.	Lead and implement new services to improve patient access of care	Convergence
Efficacy and Efficiency	Better collaboration and effective follow ups. Increased safety. Cost-effectiviness	Review of processess and re-structurasation of care. Increased savings, decreased admissions due to re-organisation of professional functions. More safety in the process.	Convergence
Interdisciplinarity	Increased exchange, patient flow and team support. Less parallel practice, expertises are better organised.	Working togueter within join protocols of care and shared decisions.	Convergence
Clientele Benefit from nursing paradigm	Emphasis in promotion and prevention	Nursing global vision supports change of habits and promotes self-care.	Convergence
Change in mindset	Habit of team management and collaboration between professions is gradually developing .	Supporting innovative nurising practice and new roles in practice within the team.Increase collaborative practices	Convergence
Better Understanding of Nursing Roles	Expanded nursing scope of practice is developing and better understood within health profesionals	Identify scope of practice, re-think organisation of functions and re-definition of tasks.	Complementarity - Diferent scope of practice and role definition
Quality of Care and Patient Satisfaction	-	Value to the system and increased patient confidence in the process.	Silence
Patient Empowerment and shared decisions	-	Increased patient educationand informed decisions	Silence
Enhance Transitional Care	-	Continuation of services and standarisation of care among levels. Transitional care following discharge and hospitalisation at home.	Silence
Workforce Satisfaction	-	Professional development gets further professional satisfaction.	Silence
Percived Barriers and Facilitators			
FACLITATORS			
Good comunication	Join discussions within the tea. Formal or informal regular comunication was seen as important.	-	Silence

Right to Prescribe	Nurse Practitioners can refill prescriptions but cannot start or adapt a medicine treatment.Collaborative prescriptions can assist with recurrent population issues	-	Silence
Clientele	Triaging of patients helps develop trust and collaboration with the team. APN can maximaize their role through pediatric or chronic disease managemen in walk-in clinics.	-	Silence
Supportive Managers and Clinicians	"Embassador" role that contributes to the development of practice authonomy and to negotiate with other key stake-holders.	Nurse managers support and motivation to re-organise team and care.	Convergence
Finance	External funding for resources and shaping scope of care delivered.	Economic funding for implementation and professional wages	Convergence
Political and Organisational Drive-Vision	Leadership and vision of how the model of care should be developed.	Political motivation to develop the role. Vision of the agenda for changing professional careers.	Complementarity - Diferent stages of implementation process.
Interprofessional Collaboration	Continuing education from physicians on dat-to-day basis is recognised. Goal of working toghether for patient´s benefit. Working on collaboration rather than competion.	Need to work across services versus tradicinal service models.Being adaptable to patients needs and prioritizing versus organisational needs in collaboration with others.	Complementarity - In Quebec they look for better ways to improve collaboration. In Catalonia, they talk about the need.
Innovation/ Open-Minded	Team innovations and been open to new situations of care.Flexibility and adaptation to new situations	Innovative ways to improve services. Organisational authonomy to implement new services.	Convergence
Understanding and acceptance of APN by others	Decreased confusion about the role and frustation of mistakes.	Facilitation of implementation if others professionals see APNs as an expert and leader in their respective areas. Knowing the functions and tasks of the role.	Convergence
Evolution and Promotion of the Role	Projects illustrating the potential of the role.	Need for organizations to create specific job positions with the person specifications. Create spaces of oportunity to show the added value.	Convergence
Planning Implementation	Well planned integration, definition of roles and functions and involvement of the whole team.	Plan and facilitate implementation in practice. Defining team functions and hiring human resources accordingly.	Convergence
Access to professional development and training	Keeping up to date with evolving population needs and knowledge. Formal and informal adquision of knowledge.	Human resources policies that promote permanent employers rather than hiring well qualified staff increases difficulties and does not promote talent retention. No positions available for APNs. Constant rotation of staff and physicians have to be constantly training nurses to a specific skills within the team.	Dissonance
Self- confidence and increased knowledge	Stablish impact of care and maintain continuity.Indicators based on the quality of the relationship developed with the client.	Access to academic training allows methodological resources to evaluate services and improvement of services.	Convergence
Role authonomy and definition of scope of practice	Specific job descriptions and job especifications for APN. Matching care delivery, using the principle of subsidiarity and development of skills of the subordinate roles.	Nursing bodies agreement on the definition and functions of the role and differenciate them with the role of registered nurses.	Convergence
Authonomy of the System to Develop the Role	-	further flexibility and creativity to develop new roles	Silence
Monitoring Otcomes and Added Value	-	Showing efficiency to improve or maintain outcomes creates new opportunities and sustainability of the role. Agreement on the need for development.	Silence
Recognition and regulation of the role	-	Legal framework of the role	Silence
BARRIERS			
Delay in the System	Electronic patient records and computer operation not ready to integrate APNs identification numbers, prescriptions...	-	Silence
Lack of comunication	Project implementation from top-down and professionals are not sufficiently informed. Communication within the team.	-	Silence
Organizational limitations	Physical space issues, professionals schedules, duplication of tasks.	-	Silence
Misreading of the role	Explaining the role is a on-going process that can lead to not achiving full potential or being to expert to perform certain tasks. Some patients could have wrong image of what is the nursing role.	Lack of visibility and definition of the role leads to confusion withing health professionals and APNs themselves.	Convergence
Working conditions	No ability to price for professional training, no schedule flexibility or no compensation for overcharge of work.	Standard nurse-led clinics and dependability of physicians schedule decrease flexibility of care. Lack of authonomy make care situations depending on other professionals and lacks continuation.	Convergence
Trainning issues	Not adapted cademic education to clinical need. Not enough emphasis on clinical judgement and physical or mental assesment.	Lack of variation of academic training for APNs.	Convergence
Inertia-evolution process	Slow implementation process.	Cultural innertia to remain unchange as professions.	Convergence
Limitation regarding role expression	Legal rules regarding prescription and diagnostic test are restrictive. Not cooperation from other profesionals could lead to not recognition of nursing authonomy.	Limeted scope of practice and authonomy.	Convergence
Role opposition	Interprofesional competition, oposion of physicians or patients to transfer the care to the APN. Oposition from own nursing profession.	Interprofessional and nursing unions opposition . Physicians could see new re-organisation of functions as professional intrusism. Patients may not accept to see APNs while they have been attended by physicians.	Complementarity - Nursing opposition not mention in one setting.
Lack of understanding of the need	Covering the gap and understanding the added value in the services provided.	Lack of service evaluation could not show a need for further implementation of roles. No consensus on the need.	Convergence
Lack of legal framework	-	Lack of stablisehd core competences, formal training and defined functions. Lack of regulation	Silence
Lack of vision for the role	-	Lack of team leadership and political drive	Silence
Finantial issues	-	Decreased budget in organisations	Silence

Table 2. Common Themes for Percived Barriers and Facilitators Levels

| Context levels	Unique Themes in Quebec	CommonThemes	Unique Themes in Catalonia
Barriers			
Practice Level	IT delay in the system	Lack of comunication	Nursing culture and no-challenging of status Quo
		Interprofesional opposition	Lack of self-confidence
Organisational Level		Organizational limitations	Lack of evaluation
		Misreading of the role	Nursing unions oposition
		Trainning issues	
		Working Conditions	
External enviroment Level		Limitations on role experession	Lack of legal framwork
		Misreading of the role	Lack of vision for the role
		Role opposition	Lack of understanding of added value
Implementation Pathway		Inertia- evolution process	Finantial issues
Facilitators			
Practice Level		satisfactory communication	
		Right to prescribe	
		Self-confidence and knowldege of own role	
		Trust and respect inside the team	
		Collaboration	
		Understanding and acceptance of APN by others	Monitoring access and added value
		Supportive managers and clinicians	Authonomy of the system to thevelop the role
Organisational Level		Collaborative project development	Access to career ladder
		Innovation and open-minded organisation	
		Evolution and promotion of the role	
		Access to training	
External enviroment Level	types of clientele	Goverment drive/Vision for the role	
	Explanation of the role to patients	Authonomy and definition of scope of practice	Recognition and regulation of the role
		Agreement of the need	
		Nursing in health policy and decision making	
Implementation Pathway		Professional motivation	
		Finance	
		Planning role integration and evaluation	

CHAPTER V: DISCUSSION

The different studies, that shape this doctoral thesis, approach and provide comprehensive information about the implementation of advanced practice nursing in Catalonia, Spain. **This new knowledge is necessary step in describing current nursing practice, performance requirements, and work environments that influence the implementation of advanced practice nursing in our context and internationally.**

The results obtained from the translation, adaptation and testing of the Spanish version of the Modified APRD tool (ANEX 4) allowed to adapt an instrument that is able to differentiate between standard nursing roles and APNs by the level of activities undertaken across six domains of practice, expert care planning, integrated care, inter-professional collaboration, education, research, evidence-based practice and professional leadership that defines the APN spheres in Catalonia for health system optimization (Figure 6). The need to differentiate advanced practice roles and classify an advanced level of practice persists and is becoming increasingly urgent in the international landscape. This study represents the first attempt to examine the reliability and the validity of a Spanish tool capable to delineate APN domains and activities. **The results provided positive support for the instrument´s validity and reliability among APNs in a Spanish nursing/midwifery population in a dual tertiary and community hospital**. The instrument could be valid and relievable in similar context.

Factor analysis on data from the sample population supports the construct validity of the Spanish version of the tool; the findings supported six APN factors/domains which were broadly similar to the original tool's five domains. The original domain, "Direct comprehensive care" included activities related to care planning (patient history, documentation, diagnostic tests, assessment, etc.) and activities related to holistic/integrated care (interdisciplinary plan, decision-making, family response and collaboration with other professionals) and were all included in a single domain. The segmentation of the original dimension "Direct comprehensive care" into two new domains could indicate that participants may distinguish between expert care practice activities which relates with direct patient clinical specialist care and integrated care which encompasses comprehensive holistic activities related to the patient and significant others.

As APN roles have not been implemented formally in the context of study, nurses that perform advanced practice could have difficulty integrating all activities as a single domain rather than two distinct sets of competencies: expert care planning and integrated care. How APNs enact their roles is highly variable in response to population health and practice setting needs, which may support these results. Results support the reliability of the tool as estimated by internal consistency and test-retest stability. The internal consistency estimate is consistent with findings from the original tool which reported a Cronbach´s alpha of 0.94 in a large nursing/midwife population in Australia (Chang, Gardner, Duffield & Ramis, 2011) providing support for the domains and activities, which were remarkably similar to those in the original (Mick & Ackerman, 2000) and modified tools (Chang, Gardener, Duffield, & Ramis, 2010). The corrected item-to-total correlations for all 38 final items exceeded the 0.3 criterion (Cronck, 2004), suggesting homogeneity of the measure and that each item was measuring a unique construct. Furthermore, test-retest stability, measured though intra-class correlation, produced a stable score across time, therefore could be used to analyse the progress and extend of advanced practice in APN roles implementation over time. Role delineation studies are done to identify essential activities, knowledge and/or skills required to be a competent professional in the chosen field. Healthcare systems try to respond to new population demands extending the services and practice of their workforce. However, there is no current consensus of the performance level of APNs. For example, should an APN be expected to practice at a high level across all domains? Or is it acceptable for an APN to function at the highest level on some domains and at a lower level on others? Clarification of role expectations is an important issue for the nursing profession, as well as employers who may be unsure about the precise scope of responsibilities for APNs. Advance practice nursing is a developing role that has been implemented partially or totally is some areas in Catalonia. As the role and services provided are novel, difficulties on the legality of the practices may emerge. Many countries such as the USA, the UK, Australia or The Netherlands, have overcome these problems by granting privileges to advanced practice nurses such as drugs prescription or diagnostic test requests by implementing clinical protocols where the law is not established (William et al., 2000) (Wong & Chung, 2006) although this is only an interim measure.
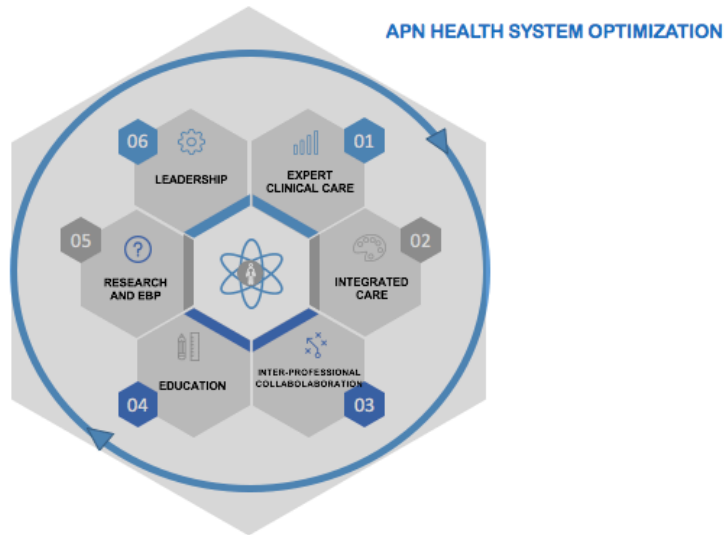
Ideally, a legislation to standardize advanced practice nursing should be created (Phillips, 2006). Results of the second article describe the profile of advanced nursing practice by exploring the extent and patterns of advanced practice domains and activities. **Evidence showed some extent of advanced nursing practice activity in most of the nursing positions that participated in the study**, with registered midwives performing more advanced practice activities than nurses in other positions. Most of midwifes roles have been practicing for longer and have been able to gain formal and social recognition of the role. **Nursing grade on the hospital career ladder also had a strong relationship with most domains and was a relevant predictor for the domains of education, research, and professional leadership**. Age, experience and education were seen to have the least affinity with advanced practice dimensions and were poor predictors in the study context. Traditionally, advanced practice activities have not been influenced by the conceptualization of nursing roles, so age, experience and education have not been taken into account when implementing new services. Age and experience have been shown in previous studies (Gardner, Chang, Duffield & Doubrovsky, 2012) not to influence the level of advanced practice nursing activities that these nurses

performed, unlike education where those with higher levels of education performed significantly more advanced practice activities in most domains.

The introduction of a common European framework and a wide range of post-graduate education courses in nursing have supported progress in education although nursing reform and curriculum design in Spain has been introduced only recently and is still at an early stage (Zabalegui & Cabrera, 2009). Nevertheless, participants' educational level showed a well-founded association with inter-professional collaboration, professional leadership, research and evidence-based practice. There was no specific nursing position that strongly influenced all APN dimensions. In Catalonia, Spain, despite educational advances and recognition of the academic distinction between general and specialist nurses in clinical practice there are no specific positions for these highly-trained professionals (except midwifes), which limits the potential benefits they could bring to their practice. Midwives could be considered to be in a privileged situation compared with other peer specialists, since midwifery is the only specialty that is recognized professionally. This could explain why midwives performed the most advanced practice activities as they were capable of practicing in an autonomous manner, particularly in expert care planning, integrated care and education. In contrast to the original study (Gardner, Chang, Duffield & Doubrovsky, 2012) the study results did not show a linear relationship between nursing grade and advanced nursing practice domains, with the exception of inter-professional collaboration and research. The findings support some current nursing positions as strong predictors of advanced practice activity in clinical practice, probably indicating than further professional development in other advanced nursing practice domains is required in these positions, such as inter-professional collaboration, research and evidence-based practice, and professional leadership. These non-clinical domains are necessary to integrate all advanced practice activities and could have an impact on the effectiveness of the roles (Bryant-Lukosius et al., 2013). The integration of these domains has demonstrated its effectiveness in improving health systems, patient outcomes, efficiency and effectiveness (Bryan-Lukosius et al., 2015; Donald et al., 2015). The development and implementation of APNs affects health care delivery, organization, management, workforce planning, policy and research outcomes (Andregård & Jangland, 2014), creating sustainable nursing services that meet the needs of the study context. Currently, there are no available workforce data identifying the number of nurses working as specialist nurses in Spain, just as there is no distinct nursing registration for trained specialist

nurses. Most specialist nurses work as generalists as there is a shortage of suitable advertised positions and intense competition among nurses to obtain those that do exist. Some 49% of general nurses in Spain were found to be unable to educate patients due to lack of time (Aiken et al., 2012) which reflects the absence of support for advanced practice. The lack of nursing positions in clinical practice clashes with research evidence in the literature on the need to increase nursing positions in a sustainable way (Aiken et al., 2014). Understanding the extent and patterns of advanced nursing practice may stimulate health care organizations to create evidence-driven policies in nursing practice to promote recognition, creation and development of specific professional positions. Reporting on current contextualized practice and organizational capacity could help organizations to assess the trade-offs in developing service delivery (Green et al., 2009). The findings reveal a context where the role of APNs is currently being developed but have not been fully implemented and could contribute to the existing conceptualization of the advanced nursing practice profile in the study context.

In line with previous studies, our study also identified a lack of strategic workforce planning and low performance (Roche et al, 2013). Advanced practice domains were influenced by nursing position and professional career ladder rather than age and expertise, which were found to have no influence on predicting advanced practice activity in the study context. The data allow description of the extent and patterns of advanced practice to facilitate description of change management and implementation of health care reforms. Recognition and implementation of advanced practice positions could have an influence on practice, effectively allowing innovative nursing roles to reach their full potential. The findings should provide support for evidence-driven policies to achieve effective and sustainable healthcare services and a workforce that can reach their full-potential. Our results may be useful in future research regarding advanced practice nursing, allowing comparison of advanced practice roles with those in international contexts.

The thesis further analysed qualitative narrative (figure 7) with a relational method form to complement and better understand evidence from the previous results obtained. A NA shed further light on the structure of relations connecting contextual factors on the implementation of APN roles and allowing visual assessment of convergence between participants and contextual themes. In the process, not all the participants demographics were retained, and some information was lost but by using the method suggested by Contrandriopoulos et al. (2017) to associate multiple

nodes, the study was able to retain and inter-connect multiple and complex relations of participant´s ideas, preferences and opinions. Visual representation of the network between contextual factors and participant´s involved in the development of APN facilitated dimensional analysis and interpretation. The force-directed visual optimization algorithm facilitated the reading of the complex and dense network by integrating the quantitative indicators of node, tie, and network characteristics on the main network. This new knowledge could contribute to the existing the deficiency of context analysis in the implementation of new nursing interventions or nursing roles (Pfadenhauer et al., 2017) and give further ability to measure, document, and strategize contextual factors that affect practice. This study used participants from different contexts involved them in the public debate about the understanding of APN, felt needs, perceived outcomes, barriers and facilitators of role development.

The main network was shaped around the contextual factors of understanding of the role, needs, barriers and while perceptions of role outcomes and facilitators for role development were less frequently mentioned by participants involved in the development of the role. Throughout available literature no other research has underlined which factors are viewed as the most important for key stakeholders and other people involved in APN role development.

Within the understanding of the role, agreement was found around the role core skills, competences and qualifications. It is interesting to note that aspects mentioned by participants from all levels (local, organisational and environmental) and for all types of professions mention role aspects that are in agreement with international definition of APN (ICN, 2009). While patient management found no mutual understanding on the definition possibly due to lack of formal implementation of the role. The added value and needs found in the study also were supported by the literature, which described the importance of APN roles in increasing efficiency and sustainability of health services (Bryant-Lukosius et al., 2015). Outcomes did not appear to interrelate within each other or cluster among participants which did not produce an agreement among participants of the perceived outcomes by APN development within the context of study. Although many insist on differences in points of view between nurses and doctors, local and larger environmental levels, it's interesting to note, raised topics were supported by other studies in the literature like for example quality of care, efficacy, enhance transitional care and accessibility (Sangster-Gormley et al., 2013). Barriers and facilitators for the role development have been previously described in the literature in different contexts (Casey et al., 2017; Kilpatrick et al.,

2012) however the study gives further insight to the most significant and consensual themes in the context of study, which was seeing in previous primary analysis. Lack of understanding of the role, inertia of the profession, inter-professional opposition and lack of legal framework were the most concurrent themes as in previously research evidence. Recognition and regulation of the role and supportive managers with drive and vision for professional development where the main facilitators among participants. Much of the literature insists on the importance of these contextual factor to facilitate or impede the implementation of recommendations however studies rarely undertake a systematic analysis of the contextual structure underlying production and use of knowledge at the local level (Estabrooks et al. 2009). Understanding the contextual factors and participant's interactions with context and context (Howarth et al., 2016) could influence the development and implementation of APN roles, and will ultimately allow better understanding of the extent to which the effect of APN can be observed in different settings, allowing analysis and support of innovative APN roles.

The results of this study have the potential to contribute significantly to analyse the context characterizing the transferability and development of APN roles and assess plausibility of previous data analysis. The optimized network revealed great level of relation among the different disciplines in the understanding and needs of APN. In the other hand results showed not consensus about the facilitators that will support role development. Overall, the study empirically demonstrated associations or opposition among participants and contextual factors based on a priori group definitions, professional disciplines or roles. Further reporting of contextual factors that influence the development and implementation of advanced practice nursing roles in other countries is required to compare innovative processes.

Finally, as much of the literature insists on the importance of contexts in facilitating or impeding the implementation of recommendations however studies rarely compare areas or countries of implementation. A triangulation study was performed on the contextual structure and perception of the APN, the need of implementation and the barriers and facilitators for a successful implementation at Quebec and Catalonia. A high degree of convergence was found across both countries and clinical areas among identified role perceptions, needs, outcomes, facilitators and barriers to evidence implementation. Regarding role understanding, the autonomy, service coordination and inter-professional collaboration were the most prominent themes in both sites. Furthermore, barriers and facilitators findings suggest that numerous

discussions were common across clinical areas and health system in general. The more common themes about barriers were role opposition by professionals, patients and nursing unions, as well as training issues and lack of professional development and lack of financial incentives. While facilitators that promote implementation were the understanding and acceptance of APN by others, role autonomy, supportive managers and key stakeholders. Identifying theses points of convergence empirically builds upon what had been reported by (Nardi & Diallo, 2014) where similar issues were present across dissimilar countries. Some barriers to practice found in this research, namely prescribing authority and independent practice echo almost exactly what had been shared at international level (Fealy et al., 2015). Also, similar conclusions have been published (Sheer & Wong, 2008). These communalities are important in the sense that it may lead to a greater international understanding of the implementation process of APN roles as a whole and therefore maybe to better informed global strategies.

Some topics were country-specific, as well as some themes regarding the outcomes and motivation for APN development. For example, the few facilitators were identified varied substantially across countries. Access to professional development and training diverged as participants mentioned different realities of practice. There were some differences and silence data between both sites of analysis in terms of level of implementation and development of APN roles, although multiple commonalities and integration of data was found across both countries. There are relatively few studies reporting these variations between context despite been crucial to explain why interventions may fail or succeed (Benzer et al., 2013). Also, APN roles are flexible (Faith Donald & Alba, 2010) and complex innovations can be reinvented (Rogers, 2003), but it is important to understand what it is adapted to. For example, as explained by Brooten (2012) in "measuring outcomes of APN practice globally, it is critical to choose health outcomes or health services or system issues important in the country where the APNs practice". Furthermore, the context itself can lead to successful or unsuccessful results, for example in environment where the APN role is recognized and accepted, effectiveness can be demonstrated" (Brooten et al., 2012). Divergent findings can lead to the generation of new theories and further exploration (Perlesz & Lindsay, 2003). Mays and Pope (2000) report that comprehensiveness may be a more realistic goal for the triangulation approach. In this way, apparent contradictions (or exceptions) do not pose a threat to findings but

rather further the scope for refining strength on how one country or context of implementation differs from others.

The combined results of the studies allowed to integrate and understand dynamics of the context in which the APN implementation process takes place. Experts of the area often exacerbate this slip-page by emphasizing internal validity, often at the expense of the contextual factors that make science relevant to practice (Green, Glasgow, Atkins, & Stange, 2009). It is important to explore the perceptions of the practice, organization and decision makers' community as an essential part of an open society that values truth and ideas over interests and preferences. This project uses participants from different contexts to get them involved in the public debate and to discuss their perspectives from different levels, settings and backgrounds. The study could attribute some of the deviant data to the different stages of formal recognition of the role and its activities, like for example prescription and therapeutics adjustment and admission/discharge rights which have not been recognised at the Catalan site. Specific needs and outcomes of APNs also reflected a vast predominance of common themes despite the difference of context and population characteristics. In Quebec, the lack of both nursing and medical staff has allowed the nurses in post to develop advanced practices to meet population needs while in Catalonia, there is a need to enhance integration and coordination between different levels of care.

Implementation research that considers context is crucial when we want to transfer a complex intervention such as an APN role from one context to another to ensure a priori that the effects are the same. This triangulation process highlights the importance of exploring and understanding disagreements and silence themes that explains the purpose and nature of the data (Farmer et al., 2006). To our knowledge, this has been the first study to interpret common and unique context analysis of APN development and implementation in two countries. Previous studies have studied specific barriers and facilitators across a number of countries (Puchalski Ritchie et al., 2016) and about APN (Casey et al., 2017), however none have been conducted specifically about APN implementation within countries. The results of this project have the potential to contribute significantly to define objectives, implementation and assess the elements characterizing the transferability and implementation of APN roles in order to reduce problems that transcend national boundaries.

Innovative APN roles are of greater relevance in terms of transforming the model of care such as orientation towards long-term conditions, greater resolution,

accessibility, quality in high specialization and interdisciplinary public health. Greater clarity around these roles may assist in optimizing workforce utilization, meeting new service delivery requirements and enabling greater internal organizational cohesion, consistency and professional clarity. By applying the theory and methods of psychometrics, the study focused on the lack of specific instruments in the Spanish context to describe advanced practices. Having access to a reliable and valid instrument that allows to measure concepts of interest in their own cultures and languages reduces the bias through detection of cross-cultural ambiguities and misinterpretations which can then be minimised. It also, allows description of the extent of advanced nursing practice and evidence of current practice expectations. The Spanish version of the APRD tool (IDREPA) would allow gathering of the necessary data to describe changes in nursing activities and domains described. The validated tool provides evidence of current practice and what activities could be implemented to further develop APN in our context. Hence, by using the newly-adapted tool, **better quality data could be collected in clinical practice that could facilitate improvements in international comparability and quality of information**. This could overcome role ambiguity and sporadic role development by allowing comparison with other international contexts. Defining advanced nursing practice using a validated, adapted instrument could allow healthcare managers and other regulatory or funding authorities to effectively deploy this experienced workforce to its full potential in all dimensions of practice, resulting in benefits to patients and greater efficiency within healthcare services.

Furthermore, the conceptualization of the advanced nursing practice profile provides data which allow description of APN activities and domains in the Spanish context along with description of healthcare adaptation and change management. The study has important implications for the optimum and sustainable use of the nursing workforce in a public community and tertiary hospital and describes the nursing profile and nomenclature in the study context. Defining the extent of advanced practice activities and domains using a validated, adapted instrument could help organizational leaders and authorities to manage the resources and expert workforce to support sustainable and effective new ways of working in all dimensions of clinical practice, eventually resulting in advantages to patients and fast-changing healthcare organizations. The development and the introduction of APN roles in a specific health care setting represents a paradigm shift for nurses, physicians and other health care workers. On one hand the traditional and strongly defended notion of "equality"

among clinical nurses is challenged when nursing education varies from a basic education of three/four years to official master and doctoral level. This differentiation in educational preparation and therefore competency levels in clinical practice calls for a system that allows differentiation in clinical nursing positions. Clarification of role expectations is an important issue for the nursing profession, as well as employers who may be unsure about the precise scope of responsibilities of these innovative roles.

Understanding the contextual factors that influence the development and implementation of APN roles, will ultimately allow better understanding of what it is understood by APNs, felt needs for the role and perceived outcomes of role development. In fact, where context is generally poorly understood, there is no real ability to understand how knowledge acquired in one country can be translated and adapted to be useful for other countries (Andregård & Jangland, 2014; Dowling, Beauchesne, Farrelly, & Murphy, 2013). Reporting on how context influence the development and implementation of APNs roles at local, organizational and national levels allow other potential users to judge the trade-offs in adopting new innovations successfully (Green, Glasgow, Atkins, & Stange, 2009). **The NA provided a visual map of the structure of relations connecting contextual factors in APN development in Catalonia and has expand our understanding of the context in which the development process takes place, including participant's interactions and context. It has also raised the barriers and facilitators that these roles have in their local context.** This study contributes to understand the structure of relations from contextual factors and participants involved in the development of APN. Gaining a better understanding of efficient and thorough ways to describe, assess and measure complex contextual characteristics is important to continue to develop greater knowledge about what affects APN role development and implementation, in order to better inform local contexts. Understanding the contextual factors that influence the development and implementation at practice, organisational and environmental level, will ultimately allow better understanding of the extent to which the effect of APN can be observed in different settings, allowing analysis and support of innovative APN roles. The development and the introduction of APN roles in a specific health care setting represents a paradigm shift for patients, nurses, physicians and other health care workers. Better understanding of what it is understood by APNs, as well as the needs, barriers and facilitators that these roles have in their local context allowed more confident understanding of the link between

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APN implementation dynamics and the political and social structures surrounding the role. The idea that APN context converge and integrated by different methods of analysis could assist further development and implementation to allow improvement of structures, processes and health outcomes. Cross verification of results from two sources allows validation and better understanding of efficient and thorough ways to describe, assess and measure complex contextual characteristics if we aim to continue to develop greater international knowledge about what affects APN role development and implementation, in order to better inform local contexts.

CHAPTER VI: APPICABILITY AND BENEFITS
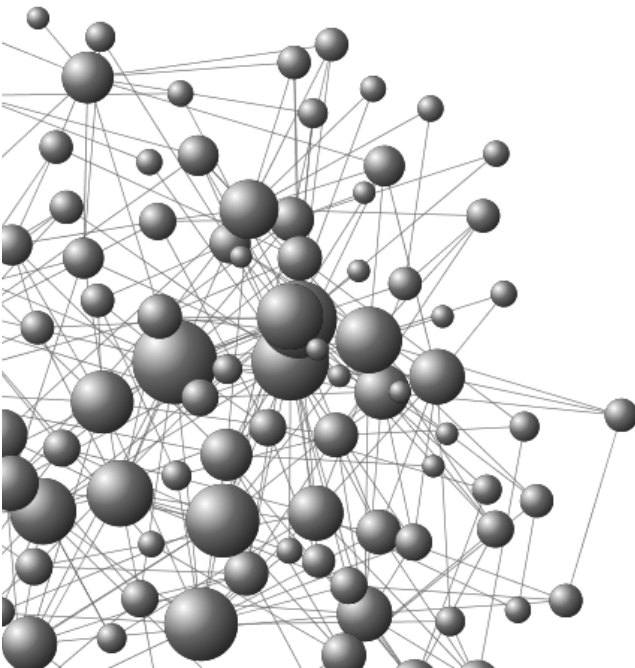# OF FURTHER RESEARCH
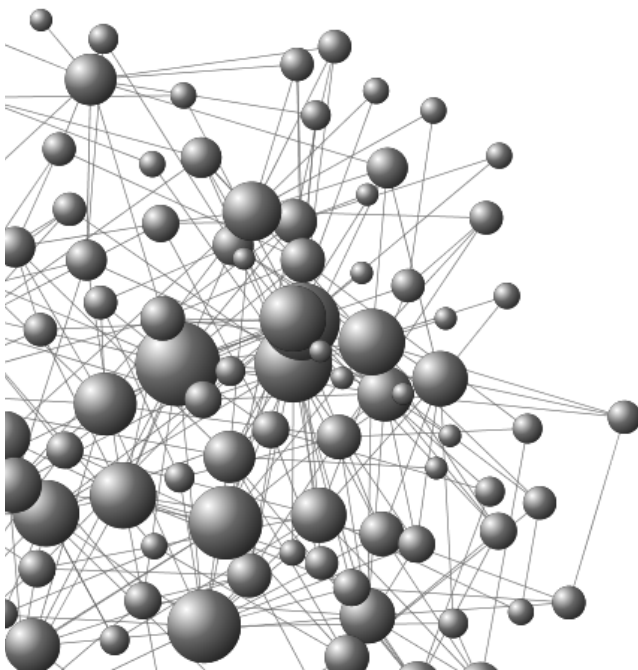
The development and the introduction of APN roles in a specific health care setting represents a paradigm shift for nurses, physicians and other health care workers. On one hand the traditional and strongly defended notion of "equality" among clinical nurses is challenged when nursing education varies from a basic education of three/four years to official master and doctoral level. This differentiation in educational preparation and therefore competency levels in clinical practice calls for a system that allows differentiation in clinical nursing positions. Greater clarity around the role of APNs and other nurses may assist in optimising workforce utilisation, meeting new service delivery requirements and enabling greater internal organisational cohesion, consistency and professional clarity. These are important factors in optimising favourable outcomes for staff, patients and the organisation in general.

Based on the results obtained from the study, future research could be carried out that would be of interest in the field of health, implementation research and social innovations:

- ***Design new strategies to collect process and outcome data*** *relevant to healthcare organizations and to the research team.*
- *Design new strategies to assist healthcare organizations in **using data for continuous improvement***
- **Operationalize and evaluate common measurement strategies** to generate transportable results
- **Evaluate of the cost-efficiency and real impact** of APN roles in local context
- **Validation of new protocols and standards of care for the APN role** at local and national level.
- **Design new strategies for collective learning and consensus decision making** in the health planning process for the effective implementation of APN roles.

CHAPTER VII: CONCLUSIONS

The conclusions of this doctoral thesis are based on the comprehensive evaluation of the implementation of advanced practice nursing performed through the different articles presented:

1. *A comprehensive review of the existing international questionnaires and instruments that define the domains of Advanced Practice Nursing identified and explored seven studies, including an analysis of the design process, the defined domains, the main results and exploration of clinometric properties. Not all proved to be valid, stable or reliable tools. The best instrument to analyse APN roles independent of their area of practice was found to be the Modified Advanced Practice Role Delineation (APRD) tool.*

2. *The Spanish version of the modified APRD tool showed evidence of adaptation, validity and reliability for use in a nursing and midwifery population in the Spanish context. The tool showed internal consistency for the tool with a Cronbach's alpha coefficient of 0.86 and for each of the factors: expert care planning (α = 0.92), integrated care (α = 0.91), interprofessional collaboration (α = 0.84), education (α = 0.83), research and evidence-based practice (α = 0.82), and professional leadership (α = 0.86). All items showed temporal stability (p <0.05) over time.*

3. *The results provide a framework for delineating and measuring the extent of advanced nursing domains and activities in the study context. The tool was found useful to measure the extent of advanced nursing practice and activities within the study population and to influence role delineation. The tool assists to overcome role ambiguity and false expectations which could benefit future practice, professional development and policy regarding advanced nursing practice.*

4. *This study describes the profile of advanced nursing practice in the study context by exploring the extent and patterns of advanced practice domains and activities within expert care planning, integrated care, inter-professional collaboration, education, research, evidence-based practice and professional leadership. Results showed the extent of advanced nursing practice activity in most of the*

nursing positions that participated in the study, with registered midwives performing more advanced practice activities than nurses in other positions.

5. *Practice domains were more strongly influenced by the predictors of nursing position and professional career ladder. For instance, registered midwives performed more advanced practice activities than nurses in other positions. The professional career ladder was a relevant predictor for the domains of education, research, and professional leadership, with higher nursing grades performing more activities on those domains. Age and experience were found to be weak predictors of advanced practice domains in the context of study.*

6. *A visual network map of the structure of relations connecting contextual factors in APN development in Catalonia raised the barriers and facilitators that these roles have in Catalonia. The network revealed that understanding of the APN role was at the center of the network, raised by 75% of participants from different health disciplines and it consequently the largest topic among them.*
Inter-professional opposition, lack of legal framework, inertia of the own profession/ resistance to change and the lack of understanding for the need of the role showed the greatest associations and centressness with participants. These significant themes were surrounded by participants with mainly nursing roles indicating uniformity of opinions on the main barrier-related nodes among nurses.

7. *Network interactions and synergies built a comprehensive understanding of the dynamics of context supported previous findings of narrative data. Multiple relations and agreements among participants and context related themes were revealed, specially surrounding the added value and needs of APN roles in increasing efficiency and sustainability of health services.*

8. *Integration of findings reflected a vast predominance of convergent contextual factors despite the structural and population differences between Canada and Spain. Barriers and facilitators were almost evenly across all groups in both regions.*

9. *Triangulation analysis of findings integrated multiple facilitators, barriers, motivators of implementation and key drivers of change at multiple levels. Understanding of the role, autonomy, service coordination and inter-professional collaboration were the most prominent themes at both sites. Furthermore, barriers and facilitators findings suggest that numerous discussions covered common ground concerning clinical areas and the health system in general.*

10. *Results presented a better understanding of the link between APN implementation dynamics and the political and social structures surrounding the role in two countries, Canada and Spain. Facilitators that promote implementation included understanding and acceptance of APN by others, role autonomy, and supportive managers and key stakeholders. Common barriers to practice found in both regions, were related with prescribing authority and independent practice.*

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ANNEXES
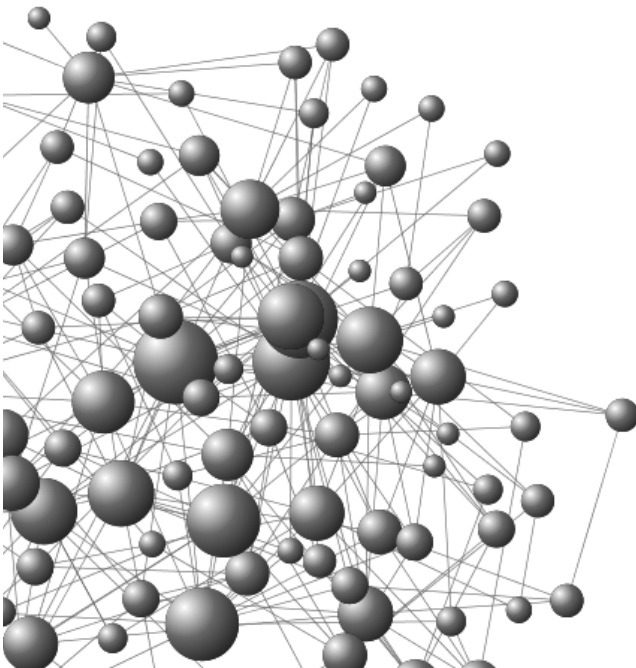
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DICTAMEN DEL COMITÉ ÉTICO DE INVESTIGACIÓN CLÍNICA

NEUS RIBA GARCIA, Secretaria del **Comité Ético de Investigación Clínica del Hospital Clínic de Barcelona**

Certifica:

Que este Comité ha evaluado la propuesta del promotor, para que se realice el estudio:

DOCUMENTOS CON VERSIONES:

Tipo	Subtipo	Versión
Hoja Información de Paciente	versión 0.2 de 7/08/2014	versión 0.2 de 7/08/2014
Protocolo	versión 0.2 de 07/08/2014	versión 0.2 de 07/08/2014

TÍTULO: ROLE DELINEATION STUDY OF ADVANCED PRACTICE NURSING, A CROSS-SECTIONAL STUDY OF PRACTICE DOMAINS AND TRENDS IN ROLE FUNCTIONS

INVESTIGADOR PRINCIPAL: SONIA SEVILLA GUERRA; ADELAIDA ZABALEGUI

y considera que, teniendo en cuenta la respuesta a las aclaraciones solicitadas (si las hubiera), y que:

- Se cumplen los requisitos necesarios de idoneidad del protocolo en relación con los objetivos del estudio y están justificados los riesgos y molestias previsibles.
- La capacidad del investigador y los medios disponibles son apropiados para llevar a cabo el estudio.
- Que se han evaluado la compensaciones económicas previstas (cuando las haya) y su posible interferencia con el respeto a los postulados éticos y se consideran adecuadas.
- Que dicho estudio se ajusta a las normas éticas esenciales y criterios deontológicos que rigen en este centro.
- Que dicho estudio se incluye en una de las líneas de investigación biomédica acreditadas en este centro, cumpliendo los requisitos necesarios, y que es viable en todos sus términos.

Este CEIC acepta que dicho estudio sea realizado, debiendo ser comunicado a dicho Comité Ético todo cambio en el protocolo o acontecimiento adverso grave.

y hace constar que:

1º En la reunión celebrada el día 10 de septiembre de 2014, acta 15/2014 se decidió emitir el informe correspondiente al estudio de referencia.
2º El CEIC del Hospital Clínic i Provincial, tanto en su composición como en sus PNTs, cumple con las normas de BPC (CPMP/ICH/135/95)
3º Listado de miembros:

Presidente:
- FRANCISCO JAVIER CARNE CLADELLAS (Médico Farmacólogo Clínico, HCB)

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Secretario:
- NEUS RIBA GARCIA (Médico Farmacólogo Clínico, HCB)

Vocales:
- ITZIAR DE LECUONA (Jurista, Observatorio de Bioética y Derecho, UB)
- MONTSERRAT GONZALEZ CREUS (Trabajadora Social, Servicio de Atención al Usuario, HCB)
- MIRIAM MENDEZ GARCÍA (Abogada, HCB)
- MONTSERRAT NUÑEZ JUÁREZ (Enfermera, HCB)
- JOSE RIOS GUILLERMO (Estadístico, Farmacología Clínica, USEM, UASP, HCB)
- JOSE MIGUEL SOTOCA (Farmacéutico Atención Primaria, CAP Les Corts)
- ANTONI TRILLA GARCIA (Médico Epidemiólogo, HCB - Director UAPS)
- OCTAVI SANCHEZ LOPEZ (Representante de los pacientes)
- MARIA JESÚS BERTRAN LUENGO (Médico Epidemiólogo, HCB)
- MARTA AYMERICH GREGORIO (Médico Hematólogo, HCB)

En el caso de que se evalúe algún proyecto del que un miembro sea investigador/colaborador, este se ausentará de la reunión durante la discusión del proyecto.

Para que conste donde proceda, y a petición del promotor,

Barcelona, a 08 de julio de 2015

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ANNEX 2: CONSENT FORM FOR PARTICIPANTS OF ROLE ANALYSIS STAGE

<u>**ANÁLISIS DE ACTIVIDAD EN ROLES DE PRÁCTICA AVANZADA EN ENFERMERÍA**</u>

Muchas gracias por tomarte el tiempo para completar este cuestionario de la dirección de enfermería del Hospital Clínic de Barcelona (HCB). El presente cuestionario tiene como objetivo analizar las diferentes actividades de práctica avanzada que se realizan en el HCB así como identificar las diferentes áreas de futuro desarrollo, educación y aprendizaje.

El análisis consta de tres partes: parte A recoge información individual de las/los participantes, sobre su práctica diaria y sobre los servicios a pacientes o grupos dentro del Hospital. Parte B contiene actividades de práctica avanzada a nivel internacional. Parte C consta en indicar cuánto tiempo empleas en cada uno de los cinco dominios de la práctica avanzada de enfermería.

El cuestionario tiene una duración aproximada 30 minutos y es de participación voluntaria. Es importante ser honesto y proveer unas respuestas precisas para ayudarnos a identificar el desarrollo de los roles avanzados. Lee cuidadosamente cada una de las preguntas y considera la evidencia disponible para corroborar tus respuestas.

Apreciamos enormemente que te tomes el tiempo necesario para completar este cuestionario. Toda la información que se proporcione será estrictamente confidencial, y los nombres no aparecerán en ningún informe de resultados de este estudio. También se puede realizar online a partir del siguiente enlace:

https://docs.google.com/forms/d/168o8Jyk8eIZ6x8cFK5cKs19vZsUQSujhM2RmV0uMf0/view form

Si deseas rellenar este cuestionario por Internet y quieres que se te envíe por email, tienes preguntas acerca de este cuestionario o necesitas ayuda para cumplimentarlo contacta con Sonia Sevilla por correo electrónico a sevilla@clinic.ub.es o por teléfono al 93 227 54 81 ext 4400.

La fecha límite para la entrega del cuestionario es el 15 de Octubre del 2014

Por favor confirma si has leído y entendido la información, das tu consentimiento informado y deseas continuar con el cuestionario

☐ *Sí, he leído la información y consiento mi participación en este estudio*
☐ *No*

ANNEX 3: RESEARCH ETHICS COMMITTEE FOR CONTEXT ANALYSIS STAGE

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Hospital Universitari

DICTAMEN DEL COMITÉ ÉTICO DE INVESTIGACIÓN CLÍNICA

NEUS RIBA GARCIA, Secretaria del **Comité Ético de Investigación Clínica del Hospital Clínic de Barcelona**

Certifica:

Que este Comité ha evaluado la propuesta del promotor, para que se realice el estudio:

DOCUMENTOS CON VERSIONES:

Tipo	Subtipo	Versión
Hoja Información de Paciente	v 1.0 20/01/2016	V1
Protocolo	v 1.0 20/01/2016	V1

TÍTULO: UNDERSTANDING THE ELEMENTS OF CONTEXT THAT INTER-INFLUENCE THE DEVELOPMENT AND IMPLEMENTATION OF INNOVATIONS, SUCH AS ADVANCED PRACTICE NURSING ROLES (APN), IN TWO COUNTRIES.

INVESTIGADOR PRINCIPAL: SONIA SEVILLA GUERRA

y considera que, teniendo en cuenta la respuesta a las aclaraciones solicitadas (si las hubiera), y que:

- Se cumplen los requisitos necesarios de idoneidad del protocolo en relación con los objetivos del estudio y están justificados los riesgos y molestias previsibles.
- La capacidad del investigador y los medios disponibles son apropiados para llevar a cabo el estudio.
- Que se han evaluado la compensaciones económicas previstas (cuando las haya) y su posible interferencia con el respeto a los postulados éticos y se consideran adecuadas.
- Que dicho estudio se ajusta a las normas éticas esenciales y criterios deontológicos que rigen en este centro.
- Que dicho estudio se incluye en una de las líneas de investigación biomédica acreditadas en este centro, cumpliendo los requisitos necesarios, y que es viable en todos sus términos.

Este CEIC acepta que dicho estudio sea realizado, debiendo ser comunicado a dicho Comité Ético todo cambio en el protocolo o acontecimiento adverso grave.

y hace constar que:
1º En la reunión celebrada el día 11 de febrero de 2016, acta 3/2016 se decidió emitir el informe correspondiente al estudio de referencia.
2º El CEIC del Hospital Clínic i Provincial, tanto en su composición como en sus PNTs, cumple con las normas de BPC (CPMP/ICH/135/95)
3º Listado de miembros:

Presidente:
- FRANCISCO JAVIER CARNE CLADELLAS (Médico Farmacólogo Clínico, HCB)

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Vicepresidente:
- BEGOÑA GOMEZ PEREZ (Farmacéutica Hospitalaria, HCB)

Secretario:
- NEUS RIBA GARCIA (Médico Farmacólogo Clínico, HCB - CDB-HCB)

Vocales:
- ITZIAR DE LECUONA (Jurista, Observatorio de Bioética y Derecho, UB)
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- MIRIAM MENDEZ GARCÍA (Abogada, HCB)
- MONTSERRAT NUÑEZ JUÁREZ (Enfermera, HCB)
- JOSE RIOS GUILLERMO (Estadístico. Plataforma de Estadística Médica. IDIBAPS)
- JOSE MIGUEL SOTOCA (Farmacéutico Atención Primaria, CAP Les Corts)
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- MARIA JESÚS BERTRAN LUENGO (Médico Epidemiólogo, HCB)
- MARTA AYMERICH GREGORIO (Médico Hematólogo, HCB)

En el caso de que se evalúe algún proyecto del que un miembro sea investigador/colaborador, este se ausentará de la reunión durante la discusión del proyecto.

Para que conste donde proceda, y a petición del promotor,

Barcelona, a 15 de febrero de 2016

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ANNEX 4: CONSENT FORM FOR PARTICIPANTS OF CONTEXT ANALYSIS STAGE

INFORM CONSENT FORM

This informed consent form is for participants who are been invited to participate in the research title "Understanding the elements of context that inter-influence the development and implementation of innovations, such as advanced practice nursing roles (APN), in two countries"

University of Quebec a Rimouski & Hospital Clínic of Barcelona
Sponsored by the Ministère des Relations internationals et de la francophonie (MRIF) Within the project *emerging research collaborative on roles of advanced practice nursing*

This Informed Consent Form has three parts:

I. **Information Sheet (to share information about the study with you)**
II. **Certificate of Consent (for signatures if you choose to participate)**
III. **Demographics information form**

Sevilla (2015) adapted from Tomoaia-Cotisel & al. (2013)

PART I: INFORMATION SHEET

Purpose of the study

The purpose of the study is to gain an understanding of the advanced practice nursing context that goes beyond borders; it is proposed to examine the contextual factors

that influence the implementation of ANP roles in two countries, Canada and Spain. The researchers seek to answer the question "What are the multilevel contextual factors that influence the inter development and implementation of advanced practice nursing roles (APN), Quebec and Spain? More specifically, the researchers seek to answer the following sub questions, 1) What are the motivating factors for APN development, and 2) What is the current implementation pathway at the practice, larger organization and external environment level.

Three distinct groups of clinicians, managers, actors involved in management within the organization of the hospital will participate in a group discussion that will take approximately 1´30 hours: period during which a researcher will explain the project and the procedure. The discussion group will be held in the local hospital, at a time already determined. Participants will be informed in advance of the date of the focus group. The discussion will be recorded for future full transcript

What kind of risks, advantages or inconvenient could happen?

People who participate will share their perspectives and professional experience and by extension, will participate in improving knowledge about what affects them directly in this domain.

There are few disadvantages associated with actually participate in an focus group like for example the time it takes and possibly having to move to the location of the interview. Few steps can be taken to avoid this type of inconvenience. The anonymity of participants cannot be ensured in this type of research; however, the data will be denominalized and be reported by group. All identifying characteristics will be removed.

What other things there are to consider?

Qualitative data will be transcribed and the recording tape will be erased as soon as the data transcription is completed and validated. The data will be destroyed after five years

Your participation in this research is entirely voluntary. It is your choice whether to participate or not. If you choose not to participate nothing will change.

We will not be sharing information about you to anyone outside of the research team. The information that we collect from this research project will be kept private. Any

information about you will have a number on it instead of your name. Only the researchers will know what your number is and we will lock that information up with a lock and key. It will not be shared with or given to anyone.

We will ask you and others in the group not to talk to people outside the group about what was said in the group. We will, in other words, ask each of you to keep what was said in the group confidential. You should know, however, that we cannot stop or prevent participants who were in the group from sharing things that were discussed and should be confidential

PART II: CERTIFICATE OF CONSENT

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked have been answered to my satisfaction. I consent voluntarily to be a participant in this study

Print Name of Participant_____
Signature of Participant _____
Date _____
        Day/month/year

Statement by the researcher/person taking consent:

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands all the parts of this consent form.

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

 A copy of this ICF has been provided to the participant.

Print Name of Researcher/person taking the consent_____

Signature of Researcher /person taking the consent_____
Date _____
        Day/month/year

PART III: DEMOGRAPHIC DATA

1. **What is your age group:**
   □ **20-29**
   □ **30-39**
   □ **40-49**
   □ **50-59**
   □ **60-69**
   □ **70yrs and over**

2. **What is your sex:**
   □ **Male**
   □ **Female**

3. **Please indicate your current title/position:**

   _____

   _____

4. **Number of years in current position:**

   _____

   _____

5. **What is your highest level of education?**
   □ **Hospital Certificate**
   □ **Diploma**
   □ **Degree**
   □ **Post Graduate Certificate**
   □ **Post Graduate Diploma**
   □ **Masters**
   □ **PhD**
   □ **Other - please specify:**   ....
   ....

6. *Please indicate your discipline?*

- □ *Nurse*
- □ *Doctor*
- □ *Pharmacist*
- □ *Psychologist*
- □ *Psychiatrist*
- □ *HR Manager*
- □ *Allied health professional (Physiotherapist, nutritionist, counselor…)*
- □ *Other – please specify: ……………………………………………..*

7. *Please indicate your current practice setting:*

- □ *Community*
- □ *Hospital*
- □ *Aged Care*
- □ *Academic*
- □ *Political*
- □ *Other - Please specify:*

8. *What sector are you currently working in:*

- □ *Public*
- □ *Private*
- □ *Not for Profit (NGO)*
- □ *Sole trade*
- □ *Other - Please specify*

9. *Please indicate your region of work:*

- □ *Metropolitan*
- □ *Regional*
- □ *National*
- □ *Rural and Remote*

ANNEX 5: IDREPA QUESTIONNAIRE

CLÍNIC BARCELONA Hospital Universitari — INSTRUMENTO DE DEFINICIÓN DEL ROL DE LA ENFERMERA DE PRÁCTICA AVANZADA (IDREPA)

Lee cada una de las siguientes frases e indica en qué medida dedicas tu tiempo a cada una de las siguientes actividades en tu puesto de trabajo actual. Marca la respuesta más apropiada para ti. Al final encontrarás un espacio adicional para comentarios si lo consideras oportuno.

La escala utilizada es esta sección es la siguiente:

4= Muchísimo; 3= Bastante, 2= Algo, 1= Prácticamente Nada; 0= Nada

	1. PLANIFICACIÓN DEL CUIDADO EXPERTO	
1.1	Llevar a cabo y documentar la historia del paciente y examen físico correspondiente	
1.2	Hacer un diagnostico médico dentro de tu área de especialización y protocolos de salud	
1.3	Identificar e iniciar las pruebas diagnósticas y procedimientos necesarios.	
1.4	Recoger e interpretar la información de la evaluación clínica para desarrollar un plan de cuidados	
1.5	Realizar procedimientos específicos especializados	
1.6	Documentar adecuadamente en la historia clínica del paciente	

	2. ATENCIÓN INTEGRAL	
2.1	Evaluar los factores psicosociales, culturales y religiosos que afectan a las necesidades del paciente	
2.2.	Evaluar la respuesta del paciente o de la familia al tratamiento y modificar el plan de cuidados dependiendo	
2.3	Comunicar al paciente y la familia el plan de cuidados y respuesta al tratamiento	
2.4	Proporcionar counselling /educación terapéutica apropiada al paciente y su familia	
2.5	Desempeñar funciones de consultor/asesor en la mejora de atención al paciente y la práctica de enfermería	
2.6	Facilitar el proceso de toma de decisiones éticas en la atención al paciente	
2.7	Coordinar el plan de cuidados interdisciplinar del paciente	
2.8	Colaborar con otros servicios para optimizar el estado de salud del paciente	
2.9	Proporcionar educación especializada al paciente y a su familia	

	3. COLABORACIÓN INTERPROFESIONAL	
3.1	Facilitar el movimiento eficiente del paciente a través del sistema sanitario	
3.2	Consultar con otros profesionales acerca de la gestión de proyectos	
3.3	Contribuir, consultar o colaborar con otros profesionales de la salud sobre actividades de contratación y	
3.4	Participar en la planificación estratégica del servicio, departamento u hospital	
3.5	Proporcionar orientación y participación en programas de mejora de calidad de la unidad o del servicio	
3.6	Participar activamente en la evaluación, desarrollo, implementación y evaluación de programas de mejora de	

	4. EDUCACIÓN	
4.1	Evaluar los programas de educación y recomendar su revisión, según sea necesario	
4.2	Servir como educador y/o tutor clínico de enfermería y/o estudiantes de medicina, personal sanitario y otros	
4.3	Servir como tutor informal con otros miembros del personal mientras proporciona actividades de atención	
4.4	Facilitar el desarrollo profesional del personal de enfermería a través de la educación	

	5. INVESTIGACIÓN Y PRÁCTICA BASADA EN LA EVIDENCIA	
5.1	Identificar las necesidades de aprendizaje de diferentes profesionales y contribuir al desarrollo de los	
5.2	Realizar investigaciones clínicas	
5.3	Participar en investigaciones para monitorizar y mejorar la calidad de las prácticas en los cuidados a pacient	
5.4	Contribuir a la identificación de posibles fuentes de financiación para el desarrollo y ejecución de proyecto	
5.5	Utilizar la investigación para guiar la práctica y el cambio de protocolos clínicos	
5.6	Identificar la información clínica que debe de ser recogida y disponible en sistemas informáticos para futuros	
5.7	Colaborar con informáticos en el diseño de TICs (tecnologías de la información y la comunicación) para	

	6. LIDERAZGO PROFESIONAL	
6.1	Servir como portavoz de enfermería y de la institución sanitaria cuando se interactúa con otros profesionales.	
6.2	Difundir el conocimiento de enfermería a través de presentaciones y/o publicaciones a nivel local, regional,	
6.3	Servir como experto o miembro de comité de organizaciones sanitarias	
6.4	Servir como consultor/ asesor a personas individuales, grupos profesionales o no profesionales y otros	
6.5	Representar la imagen profesional de enfermería en foros institucionales y comunitarios	
6.6	Colaborar con otros profesionales de salud para proporcionar liderazgo y dar forma a las políticas públicas d	

Comentarios sobre las actividades de enfermería de práctica Avanzada. Realiza cualquier comentario que tengas sobre las actividades de esta sección

ANNEX 6: FUNDING FROM THE GOVERNMENT OF CATALONIA

Generalitat de Catalunya

Sol·licitud de subvencions per al finançament de la intensificació de professionals de la salut, modalitat de professionals d'infermeria, en l'àmbit de la recerca i la innovació en salut que es dugui a terme durant els anys 2017-2019 (PERIS 2016-2020)

Dades d'identificació de la persona, institució o entitat sol·licitant

Indiqueu el tipus de persona:

○ Persona física   ● Persona jurídica

Dades d'identificació de la persona jurídica

Raó social

Fundació Clínic per a la Recerca Biomèdica

Tipus de document d'identificació	Número d'identificació
NIF d'empresa	G59319681

Dades d'identificació del/de la representant de la persona jurídica

Nom	Primer cognom	Segon cognom
Elias	Campo	Güerri

Tipus de document d'identificació	Número d'identificació
DNI	40908557K

Gènere

Home

Telèfon fix	Telèfon mòbil	Adreça de correu electrònic
932275707		otri@clinic.ub.es

Adreça

☐ Residència fora de l'Estat espanyol

Tipus de via	Nom de la via	Número
Carrer	Rosselló	149-153

Bloc	Escala	Pis	Porta	Codi postal
				08036

Província	Comarca	Municipi
Barcelona	Barcelonès	Barcelona

Generalitat de Catalunya

Sol·licitud de subvencions per al finançament de la intensificació de professionals de la salut, modalitat de professionals d'infermeria, en l'àmbit de la recerca i la innovació en salut que es dugui a terme durant els anys 2017-2019 (PERIS 2016-2020)

Objecte de la sol·licitud

Dades de la proposta, projecte o programa de recerca i innovació en salut

Nom de la proposta, projecte o programa de recerca que es desenvoluparà en el marc d'aquesta subvenció

Comprensió dels factors contextuals que influeixen en la implementació i el desenvolupament d'innovacions, com el rols d'infermeria de práctica avançada, en dos països.

Nom del centre o centres on es desenvolupa la proposta, projecte o programa de recerca

IRS-IDIBAPS (HOSPITAL CLÍNIC)

Dades per al Programa d'Impuls del talent i la seva ocupabilitat

☐ Dades del científic/a o tecnòleg/òloga a incorporar (dades obligatòries per a l'acció instrumental d'incorporació de científics i tecnòlegs)

NIF o NIE

Nom i cognoms

Data de naixement

Titulació

☐ Dades de l'investigador/a principal del grup receptor (dades obligatòries per a l'acció instrumental d'incorporació de científics i tecnòlegs)

NIF o NIE

Nom i cognoms

Data de naixement

Nom del centre en el qual treballa

☒ Dades del candidat/a a intensificar (dades obligatòries per a l'acció instrumental d'intensificació de professionals de la salut, modalitat de professionals d'infermeria)

NIF o NIE

52407662T

Nom i cognoms

Sonia Sevilla Guerra

Data de naixement

25/06/1980

Durada total del periode d'intensificació

9 mesos

Generalitat de Catalunya

Sol·licitud de subvencions per al finançament de la intensificació de professionals de la salut, modalitat de professionals d'infermeria, en l'àmbit de la recerca i la innovació en salut que es dugui a terme durant els anys 2017-2019 (PERIS 2016-2020)

Dades per al Programa de coneixement d'excel·lència

☐ Dades de l'investigador/a principal (dades obligatòries per a ambdues accions instrumentals)

NIF o NIE

Nom i cognoms

Data de naixement

Nom del centre en el qual treballa

Sol·licitud de la bestreta del 80% de la subvenció atorgada

☒ En base a la base 20 de l'Ordre SLT/274/2016, d'11 d'octubre, per la qual s'aproven les bases reguladores i l'article 14 de la Resolució SLT/2381/2016, de 19 d'octubre, per la qual s'obre la convocatòria, sol·licito una bestreta del 80% de l'import de la subvenció atorgada.

Observacions

Observacions

Subvencions per a la recerca i innovació 2017-2019

Línia subvenció

Acció instrumental d'intensificació de professionals de la salut. Professionals d'infermeria

Acció subvencionable

Intensificació de l'activitat investigadora de professionals d'infermeria durant l'any 2017

Títol de l'activitat

Intensificació de l'activitat investigadora de professionals d'infermeria durant l'any 2017

Import sol·licitat

20.250,00 €

Total import

20.250,00 €

ANNEX 7: FUNDING FROM THE MINISTRY OF INTERNATIONAL RELATIONS OF QUEBEC

Ministère
des Relations
internationales
et de la Francophonie
Québec

Direction Europe, Afrique et Moyen-Orient

Québec, le 28 mai 2015

Madame Emmanuelle Jean
Professeure
Université du Québec à Rimouski
Case postale 3300
300, allée des Ursulines, succursale A
Rimouski (Québec) G5L 3A1

OBJET : Projet : Collaboratif de recherche en émergence sur des rôles de
pratique infirmière avancée Québec-Catalogne - 08.308
VIIIe Rencontre du Comité mixte Québec-Catalogne

Madame la Professeure,

Dans le cadre des décisions prises lors de la VIIIe Rencontre du Comité mixte Québec-Catalogne, j'ai le plaisir de vous confirmer qu'une aide financière totale de 5 220 $ vous est attribuée pour la réalisation de votre projet.

Ce montant vous est accordé pour l'année 2015-2016 par le ministère des Relations internationales et de la Francophonie selon les modalités énumérées dans la lettre d'entente ci-jointe.

Je vous saurais gré d'en prendre connaissance, d'y apposer votre signature sur les deux exemplaires et de retourner une copie électronique le plus tôt possible à l'adresse suivante : joelle.bernard@mri.gouv.qc.ca, ainsi qu'un original par courrier. Dès réception de ce document dûment signé, le chèque vous sera transmis sans délai.

En souhaitant que votre projet connaisse le plus grand succès, je vous prie d'agréer, Madame la Professeure, l'expression de nos sentiments les meilleurs.

Bernard Denault
Directeur

p. j. Lettre d'entente

Québec
Édifice Hector Fabre
525 boulevard René-Lévesque Est
Québec (Québec) G1R 5R9

Montréal
380, rue St-Antoine Ouest
Montréal (Québec) H2Y 3X7

ANNEX 8: FUNDING FROM THE UNIVERSITY OF QUEBEC AT RIMIOUSKI

UQAR
Université du Québec
à Rimouski

Bureau du doyen des études
de cycles supérieurs et de la recherche

Le 6 novembre 2015

Madame Emmanuelle Jean
Professeure
Département des sciences infirmières
Université du Québec à Rimouski
Campus de Rimouski

Madame,

Pour faire suite à votre demande de subvention dans le cadre du *Concours 2015 du Fonds institutionnel de recherche*, il me fait plaisir de vous informer que le Comité de sélection a résolu, à la suite de l'évaluation des demandes reçues, de vous accorder la somme de **6 525 $** pour votre projet : « *Comprendre les éléments de contexte qui inter influencent le développement et l'implantation d'innovations, telle que les rôles de pratique infirmière avancée (PIA), à travers deux pays.* ».

La somme octroyée par le comité sera disponible au cours des prochains jours pour vous permettre de commencer la réalisation de vos travaux de recherche. Veuillez noter que cette subvention doit être utilisée d'ici le **31 décembre 2016**.

Si vous avez besoin de renseignements supplémentaires, n'hésitez pas à communiquer avec moi.

Veuillez accepter, Madame, mes plus sincères félicitations ainsi que l'expression de mes sentiments les meilleurs.

Le doyen des études de cycles supérieurs et de la recherche,

Frédéric Deschenaux

FD/mt

c. c. :   Mme Nicole Ouellet, directrice du Département des sciences infirmières

300, allée des Ursulines, C.P. 3300, succ. A Rimouski (Québec) G5L 3A1 CANADA   www.uqar.ca

ANNEX 9: FUNDING FROM THE NURSING COUNCIL OF BARCELONA

CONVOCATÒRIA D'AJUDES A LA RECERCA INFERMERA 2016

Benvolguda Sra. Sonia Sevilla,

Finalitzat el procés d'avaluació dels projectes presentats a la Convocatòria d'Ajudes a la Recerca de la Fundació Infermeria i societat, per part del Comitè Avaluador Extern Expert en Recerca, ens plau en primer lloc felicitar a tot l'equip investigar per la qualitat científica i metodològica del Projecte: **PR-016/16** sota el títol de *Estudio de definición del rol de la enfermera de práctica avanzada, encuesta transversal sobre los dominios de práctica..*

Així mateix volem comunicar-li que l'esmentat projecte ha estat seleccionat per a ser finançat amb una dotació econòmica de **2.310 €.**

En breu ens posarem en contacte amb vostè per a decidir el dia més adient per a realitzar una reunió amb l'objectiu d'informar del procediment a seguir i de la distribució de la dotació econòmica.

Cal que tingui en compte les següents indicacions per a la nova distribució econòmica del seu projecte:

- Bens i Serveis : **1.300 €** distribuïts de la següent manera :
    - o Traducció, retro-traducció: **500**€
    - o Estadístic = **800**€

- Viatges : **800€** distribuïts de la següent manera :
    - o Congrés internacional = **800€**

- Overheads (10%): **210€**

Una vegada més, felicitar-vos per l'esforç realitzat amb l'elaboració del vostre projecte i per l'aportació a la professió infermera.

Cordialment,

Comissió d'avaluadors de projectes
Pilar Delgado i Llúcia Benito
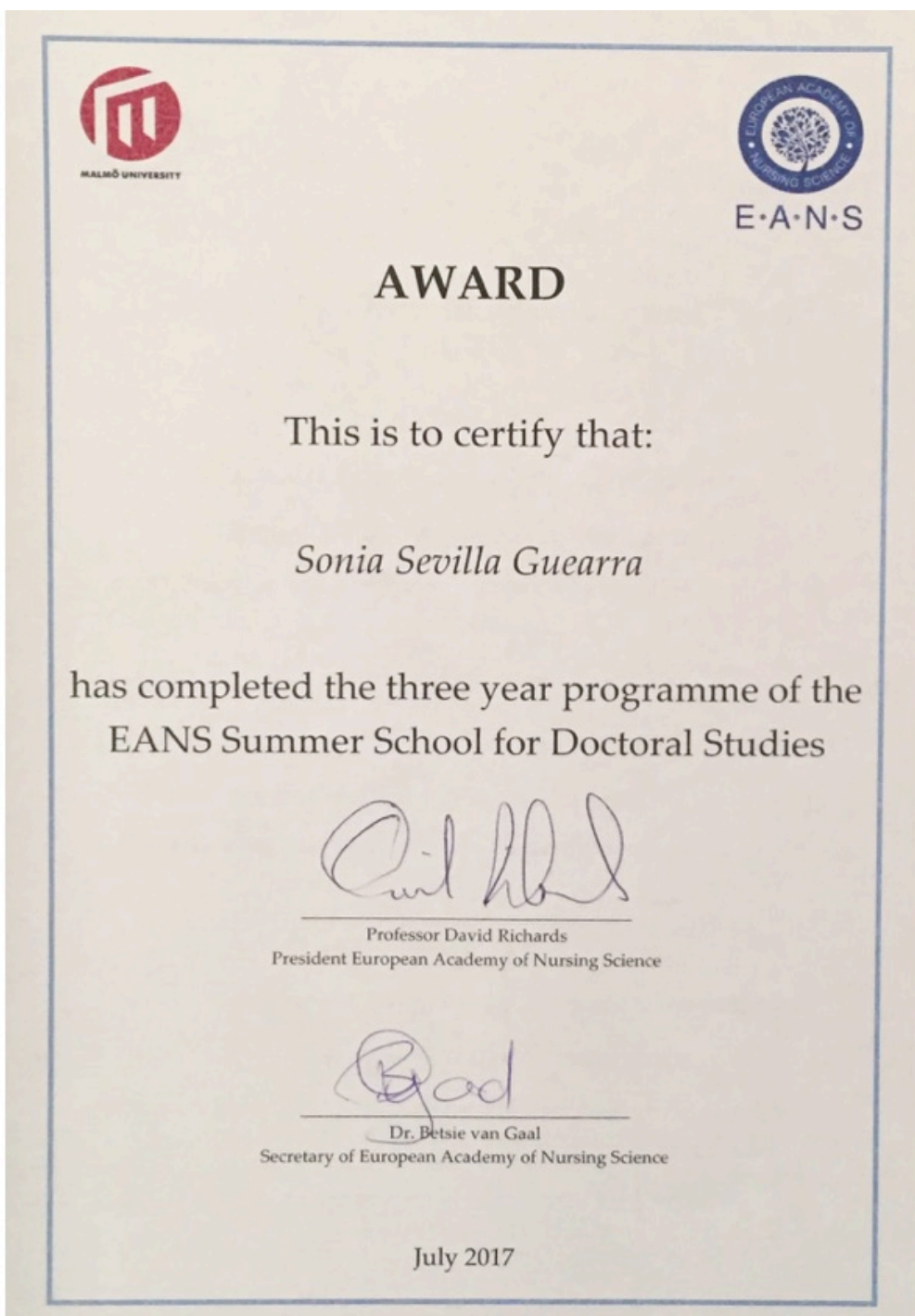Assessores de Recerca

Barcelona, 11 d'octubre de 2016

FUNDACIÓ INFERMERIA I SOCIETAT	
REGISTRE DE **SORTIDA**	
Núm.	55
Data	11/10/2016

ANNEX 10: EANS SUMMER SCHOOL FOR DOCTORAL STUDIES

EANS Summer School for Doctoral Studies

First Year

University of Barcelona, Barcelona, Spain

From the 29th of June to the 10th of July 2015

Two 40 hour week plus 20 hours of private reading and homework activity

Second Year

University of Martin-Luther Halle Witten, Halle, Germany

From the 11th July to the 15th of July 2016

One 40 hour week plus 10 hours of private reading and homework activity

Third Year

Department of Care Science, Malmö University, Sweden

from the 3rd to the 7th of July 2017

One 40 hour week plus 10 hours of private reading and homework activity

Total three year Summer School hours equivalent to 7.5 ECT