

UNIVERSITY OF TECHNOLOGY SYDNEY

UNIVERSITY OF GRANADA

# **Implementation Science in Community Pharmacy**

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**Development of frameworks, models and tools for  
introducing and integrating professional services**

**Thesis**

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**Doctor of Philosophy**

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## CERTIFICATE OF ORIGINAL AUTHORSHIP

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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# Abstract (English)

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**Background:** Internationally, professional pharmacy services are being remunerated and community pharmacies are beginning to implement, however there appears to be a pervasive challenge to achieving widespread support and integration into routine practice. The use of implementation science to conduct implementation studies and evaluate implementation efforts may assist community pharmacy move towards the ultimate goal of sustained service provision and improved health outcomes for the communities they serve.

**Objectives:** To synthesise, analyse and progress knowledge concerning implementation science, then contextualise and apply this knowledge for the implementation of professional services in community pharmacy internationally. The research aims to conceptualise and define the process, influences and indicators for the implementation of professional services in community pharmacy.

**Methodology:** Mixed methodologies were employed. Two theoretical works were conducted to develop definitions and models based on reviews of pharmacy practice, health services and implementation science literature (chapters 3 and 6). A systematic review methodology was used to investigate implementation frameworks of innovations in healthcare (chapter 4). A qualitative study involving semi-structured interviews examined the implementation process and influences in community pharmacies across Australia. Thematic framework analysis of the data was performed (chapter 5). In Spain, both qualitative and quantitative approaches were applied to develop and test two tools, for the medication review with follow-up service being implemented in Spain, as measures of the implementation outcome, fidelity (chapter 7).

**Results:** Professional pharmacy services were defined and placed within a model of the overall service offering of a pharmacy (chapter 3). The core concepts across implementation frameworks (i.e. (i) an innovation, (ii) a multi-level context, (iii) a complex multi-stage process, influenced by a range of (iv) factors, (v) strategies and (vi) evaluations), were collated in a cross-disciplinary, overarching Generic Implementation Framework (GIF) (chapter 4). The concepts were contextualised for community pharmacy as the Framework for the Implementation of Services in Pharmacy (FISpH) (chapter 5). A model for the evaluation of implementation programs and professional pharmacy services was designed to include implementation impact, process and outcome indicators (chapter 6). Two implementation tools were developed and tested: a 39 item adherence index and a 12 item, 2-factor patient responsiveness scale (chapter 7).

**Conclusion:** Implementation science provides a base for community pharmacy as they move towards the introduction and integration of professional pharmacy service. The incorporated definitions, models and tools of the framework have been applied in practice to develop implementation programs and implementation research protocols, both in Australia and Spain.

# Resumen (Español)

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**Antecedentes:** A nivel internacional, los servicios profesionales farmacéuticos están siendo remunerados y las farmacias comunitarias están empezando a implantarlos; sin embargo, lograr su integración generalizada en la práctica rutinaria está resultando un importante desafío. El uso de la ciencia de implantación para desarrollar estudios de implantación y medir indicadores de implantación de servicios puede ayudar a la farmacia comunitaria a avanzar hacia el objetivo final de la prestación sostenible de servicios y la mejora de los resultados de salud para las comunidades que atienden.

**Objetivos:** Sintetizar, analizar y avanzar el conocimiento relativo a la ciencia de implantación para su posterior contextualización y aplicación en la implantación de servicios profesionales en farmacia comunitaria. Más concretamente, la investigación pretende conceptualizar y definir los procesos, influencias e indicadores para la implantación de dichos servicios profesionales.

**Metodología:** Se emplearon metodologías mixtas. Se realizaron dos trabajos teóricos basados en la literatura científica del ámbito de la práctica de farmacia, los servicios de salud y la ciencia de implantación para desarrollar definiciones y modelos que contextualizaran el trabajo a realizar (capítulos 3 y 6). Se realizó una revisión sistemática para investigar los marcos teóricos para la implantación de innovaciones en el área de la asistencia sanitaria (capítulo 4). También se llevó a cabo un estudio cualitativo con entrevistas semi-estructuradas que examinó el proceso de implantación y los factores que lo influyen en las farmacias comunitarias en Australia (capítulo 5). En España, se aplicaron metodologías cualitativas y cuantitativas para desarrollar y testar dos herramientas que permitieran medir los resultados de la implantación del servicio de Seguimiento Farmacoterapéutico; concretamente la fidelidad (capítulo 7).

**Resultados:** Los servicios profesionales de la farmacia fueron definidos y contextualizados dentro de la oferta global de servicios que puede realizar una farmacia comunitaria (capítulo 3). Los conceptos fundamentales incluidos en los marcos de implantación (es decir, (i) una innovación, (ii) un contexto multinivel, (iii) un proceso complejo de varias etapas, influido por una serie de (iv) factores, (v) estrategias y (vi) evaluaciones), se recopilaron en un marco interdisciplinario general, el Marco Genérico de la Implantación (capítulo 4). Estos conceptos fueron contextualizados para la farmacia comunitaria en una nueva versión adaptada del mencionado marco (Marco para la Implantación de Servicios en la Farmacia) (capítulo 5). Se desarrolló un modelo para la evaluación de los programas de implantación y los servicios profesionales farmacéuticos, incluyendo indicadores de impacto, proceso y resultados de la implantación (capítulo 6). Finalmente, se desarrollaron y testaron dos herramientas de para medir la implantación de servicios profesionales: un índice de adherencia de 39 ítems y una escala de receptividad del paciente de 12 ítems en 2 factores (capítulo 7).

**Conclusiones:** La ciencia de la implantación proporciona una base para la introducción e integración de los servicios profesionales en la farmacia comunitaria. Las definiciones, modelos y herramientas incorporadas en el marco genérico de la implantación derivado de esta tesis, se han aplicado en la práctica para el desarrollo de protocolos de investigación y programas de implantación, tanto en Australia y España.

# Dissemination of Research

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## Peer Reviewed Publications

- 2016 Moullin J.C., Sabater-Hernández D., García-Corpas J.P., Kenny P., Benrimoj S.I., 2016, 'Development and testing of two implementation tools to measure components of professional pharmacy service fidelity', *J Eval Clin Pract*, vol. 22, no. 3, pp. 369-77.
- 2016 Moullin J.C., Sabater-Hernández D., & Benrimoj S.I., 2016, 'Model for the evaluation of implementation programs and professional pharmacy services', *Res Social Adm Pharm*, vol. 12, no. 3, pp. 515-22.
- 2015 Moullin, J.C., Sabater-Hernández, D, Fernandez-Llimos, F, Benrimoj S.I., 2015 'A systematic review of implementation frameworks of innovations in healthcare and resulting generic implementation framework', *Health Res Policy Syst*, vol. 13, p. 16.
- 2013 Moullin J.C., Sabater-Hernández D., Fernandez-Llimos F., & Benrimoj, S.I. 2013, 'Defining professional pharmacy services in community pharmacy', *Res Social Adm Pharm*, vol. 9, no. 6, pp. 989-95.

## Published Conference Proceedings, Trade Articles & Letters to Editors

- 2014 Moullin, J., Sabater-Hernández, D. & Benrimoj, S. 2014, 'Development of a theoretically based implementation protocol', *BMC Health Serv Res*, vol. 14, no. Suppl 2, p. P83
- 2014 Moullin, J.C., Sabater-Hernández, D. & Benrimoj, S.I. 2014, 'Implementing professional pharmacy services', *Australian Pharmacist*, vol. 33, no. 4, pp. 13-4.
- 2013 Moullin, J.C., Sabater-Hernández, D. & Benrimoj, S.I. 2013, 'Defining professional pharmacy services - the role of community pharmacy', p. 493 in 'Abstracts 8th working conference of the pharmaceutical care network Europe, 6-8 February 2013, Berlin, Germany' 2013, *Int J Clin Pharm*, vol. 35, no. 3, pp. 488-506.
- 2013 Moullin, J.C., Sabater-Hernández, D. & Benrimoj, S.I., 'Letter of response to correspondence regarding article "Defining professional pharmacy services in community pharmacy"', *Res Social Adm Pharm*, vol. 9, no. 4, p. 492.

## **Invited presentations**

- 2015 San Jorge University; 14 December, 2015: Zaragoza, Spain: 'Introduction and implementation of professional pharmacy services in community pharmacy' [Spanish].
- 2015 University Medical Polyclinic; 8-9th December, 2015; Lausanne, Switzerland: 'Introduction to Implementation Science for healthcare professionals' and 'Implementation science in community pharmacy'.
- 2015 9th Pharmaceutical Care Network Europe (PCNE) Working Congress; 4-6 February, 2015; Mechelen, Belgium: Workshop leader 'The theory of implementation.'
- 2014 San Jorge University; 14 May, 2014: Zaragoza, Spain: 'Implementation of professional pharmacy services'.
- 2014 74th International Pharmaceutical Federation (FIP) World Congress of Pharmacy and Pharmaceutical Sciences; 31 August - 4 September, 2014; Bangkok, Thailand: 'Implementation science: frameworks for implementation - theory and practice'.
- 2013 73rd International Pharmaceutical Federation (FIP) World Congress of Pharmacy and Pharmaceutical Sciences; 31 August to 5 September, 2013; Dublin, Ireland: 'Development of a professional pharmacy service implementation framework'.
- 2013 World Healthcare Students' Symposium (WHSS); 8-13 September, 2013; Lausanne, Switzerland: 'Innovation: which strategy to implement a new service?'
- 2013 8th Pharmaceutical Care Network Europe (PCNE) Working Congress; 6-8 February, 2013; Berlin, Germany: 'Implementation Science'.

## **Oral communications to scientific meetings without proceedings**

- 2015 Global Implementation Conference (GIC) 2015; 26-28 May, 2015, Dublin, Ireland: 'Measuring implementation: the construction and validation of tools'.

## **Poster communications to scientific meetings without proceedings**

- 2015 75th International Pharmaceutical Federation (FIP) World Congress of Pharmacy and Pharmaceutical Sciences; 29 September - 3 October, 2015; Düsseldorf, Germany: 'The development and testing of two tools to measure components of fidelity of pharmacy service provision'.
- 2015 IX National Congress of Pharmaceutical Care; 15-17 October, 2015; Toledo, Spain: 'Model to evaluate the implementation of professional services in the community pharmacy' [Spanish].
- 2014 2nd Biennial Australian Implementation conference (AIC); 17-18 September 2014; Sydney, Australia: 'Operationalising the Generic Implementation Framework'.
- 2014 74th International Pharmaceutical Federation (FIP) World Congress of Pharmacy and Pharmaceutical Sciences; 31 August - 4 September, 2014; Bangkok, Thailand: 'Preliminary evaluation the Framework for the Implementation of Services in Pharmacy'.
- 2013 73rd International Pharmaceutical Federation (FIP) World Congress of Pharmacy and Pharmaceutical Sciences; 31 August to 5 September, 2013; Dublin, Ireland: 'Implementation Science: its application to the implementation of professional pharmacy services'.
- 2012 72nd International Pharmaceutical Federation (FIP) World Congress of Pharmacy and Pharmaceutical Sciences; 3-8 October 2012; Amsterdam, Netherlands: 'Professional Service Implementation Index'.

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## **Preface**

This thesis is presented in fulfilment of the joint doctoral degree (Doctor of Philosophy) requirements, under the candidate program agreement between the University of Technology Sydney, Australia and the University of Granada, Spain.

The thesis is structured as a PhD by publication. Chapter 1 provides background and reasoning for the topic and the theoretical and conceptual backbone. This includes the stimulus for the central theories chosen and developed by the dissertation. Chapter 2 presents the research overview and disposition of the dissertation. An outline of the overall rationale, objectives, and organisation of the thesis is followed by an introduction to the sub-studies, how they interrelate and methodological choices. Chapters 3-8 comprise the sequential suite of results, four of which have been accepted as publications and are displayed as copies. These are preceded by Chapter 9, which discusses the results, including critiquing the data collection, analysis and interpretations, as well summarising the collective contribution of the work. Finally a synthesis of the main findings and recommendations for future research is offered.

Where participants were involved ethics approval and informed consent of participants were obtained. The ethics approvals and associated documentation are supplied as appendices following the corresponding research studies (chapter 5 and chapter 7). All responses remain confidential.

Joanna C Moullin is the primary author of each publication. In addition the publications have co-authors including thesis supervisors and collaborators who contributed to the concept, design, data collection, data analysis, data interpretation, or revision of the manuscripts.

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## Abbreviations

AF-FC Forum	Community Pharmacy Pharmaceutical Care Forum (Foro de Atención Farmacéutica en Farmacia Comunitaria)
AHI	Administrative, Handling and Infrastructure
AIC	Australian Implementation Conference
APA	Australian Postgraduate Award
ARC	Availability, Responsiveness and Continuity model
BCT	Behavioural Change Techniques Taxonomy
BCW	Behavioural Change Wheel
CFIR	Consolidated Framework for Implementation Research
CPD	Continued Professional Development
CMI	Consumer Medicines Information
CMM	Comprehensive Medicines Management
COM-B	Capability, Opportunity, Motivation – Behaviour
CONSORT	Consolidated Standards of Reporting Trials
CPA	Community Pharmacy Agreement
DIISRTE	Department of Industry, Innovation, Science, Research and Tertiary Education
DRP	Drug Related Problems
EBP	Evidence Based Practice
EFA	Exploratory Factor Analysis
EPOC	Effective Practice and Organisation of Care (Cochrane group)
ERIC	Expert Recommendations for Implementing Change
FIP	International Pharmaceutical Federation
FISpH	Framework for the Implementation of Services in Pharmacy
GIC	Global Implementation Conference
GIF	Generic Implementation Framework
GTO	Getting to Outcomes
HMR	Home Medicines Reviews
IHI	Institute for Healthcare Improvement
ISF	Interactive Systems Framework for Dissemination and Implementation
KTA	Knowledge to Action
MRC	Medical Research Council
MTA	Medicines Therapy Assessment
MTM	Medication Therapy Management

MUR	Medicine Use Review
NHS	National Health System
NIRN	National Implementation Research Network
NOM	Negative Outcomes associated with Medication
NPT	Normalisation Process Theory
PARIHS	Promoting Action on Research Implementation in Health Services
PBS	Pharmaceutical Benefits Scheme
PCA	Principle Component Analysis
PCNE	Pharmaceutical Care Network Europe
PDP	Pharmacy Development Program
PPI	Pharmacy Practice Incentive
PRECIS	Pragmatic-Explanatory Continuum Indicator Summary
QCPP	Quality Care Pharmacy Program
RE-AIM	Reach, Efficacy/Effectiveness, Adoption, Implementation Maintenance
REP	Replicating Effective Programs
RES	Research Excellence Scholarship
RMMR	Residential Medication Management Reviews
RPBS	Repatriation Pharmaceutical Benefits Scheme
SFT	Seguimiento Farmacoterapéutico (Medication review with follow-up)
SIC	Stages of Implementation Completion
SQUIRE	Standards for Quality Improvement Reporting Excellence
TDF	Theoretical Domains Framework
TIDC	Integrated checklist of determinants of practice
UGR	University of Granada
UTS	University of Technology Sydney
WHO	World Health Organisation
WHSS	World Healthcare Students' Symposium
WIDER	Workgroup for Intervention Development and Evaluation Research