Institution: Robert Gordon University

Unit of Assessment: 03 -Allied Health Professions, Dentistry, Nursing and Pharmacy

Title of case study: Developing and improving impactful models of non-medical prescribing practice, with a focus on pharmacist prescribing in targeted 'at risk' populations nationally and internationally.

Period when the underpinning research was undertaken: 2009-2018

Details of staff conducting the underpinning research from the submitting unit:

Name(s):	**Role(s) (e.g. job title):**	**Period(s) employed by submitting HEI:**
Professor Derek Stewart	Professor of Pharmacy Practice	15/11/93 – 31/03/2019
Professor Scott Cunningham	Professor of Pharmacy Education & Practice	31/10/94 - present
Dr Katie MacLure	Senior Research Fellow	19/05/2008 – 31/12/2019
Dr Katie Gibson-Smith	Research Fellow	24/06/2016 - 11/08/2019
Dr Trudi MacIntosh	Senior Lecturer Pharmacy Practice	05/09/2006 – present
Dr Antonella Tonna	Senior Lecturer Clinical Pharmacy Practice	06/01/2009 - present

Period when the claimed impact occurred: 2014-2019

Is this case study continued from a case study submitted in 2014? No

1. Summary of the impact (indicative maximum 100 words)

This research informed prescribing-practice for healthcare organisations internationally so increasing the accessibility and safety of medicines particularly to targeted populations. It led to the pan-European €1.02 million EU funded SIMPATHY project which has shaped polypharmacy management strategies globally. A health economic tool from this shows polypharmacy management prevents the prescribing of over 120,000 inappropriate medications each year in Scotland alone, with significant costs savings and reduction in adverse effects. This research has driven changes to policy and NHS contracted services leading to education of 1000s of Pharmacist Independent Prescribers, who make significant impact in the delivery of high-quality patient care.

2. Underpinning research (indicative maximum 500 words)

Poor medication practice causes human harm, and globally costs US$42 billion annually. The World Health Organisation (WHO) pledged to cut severe avoidable harm by half by 2022. This work informs service improvements that increases the accessibility and safety of medicines by focussing on non-medical prescribing, particularly by pharmacists, within the general and targeted populations, including older people with multimorbidity.

Since 2004, this research engaged international collaborators with multi-professional input. Initial research identified positive experiences with the pharmacist prescribing education programmes, highlighting a strong need for pharmacist prescribing implementation, with positive views of pre-implementation, as well as concerns from a range of policymakers, clinicians, and patient stakeholders. Research advanced to consider the progression of prescriber education into practice and encompassed the perspectives of the public, patients, pharmacist prescribers, non-prescribing pharmacists, student pharmacists, and the wider care team. This work was used nationally and internationally by regulators and professional bodies to set standards that covered practice across the whole of the UK.

The work progressed to encompass an array of approaches, including evidence-syntheses and primary research studies in the UK and internationally. The aim was to develop a multi-perspective international evidence-base for the benefit of non-medical prescribing in terms of medication use that is safe and effective for patients.

A Cochrane Review, which involved collating evidence of clinical, patient-reported, and resource use outcomes of non-medical prescribing for managing acute and chronic health conditions in primary and secondary care settings as compared with medical prescribing. The findings suggested that non-medical prescribers were as effective as usual care and deliver comparable outcomes [1]. Further reviews considered current policies and guidelines for polypharmacy management in older people [2] that also focussed on the views and experiences of stakeholders around pharmacist prescribing and the perceived facilitators and barriers to global implementation [3]. Over 30 papers have been published and the work widely disseminated, including invited presentations at international conferences.

Global issues required consideration of international dimensions. The Middle East (ME) was chosen to explore the transferability of evidence to international contexts. Evidence synthesis of poor prescribing practice in the ME led to success in obtaining US$600,000 of funding from the Qatar National Research Fund to quantify and characterise issues around medication errors [4]. Parallel research involving high-level decision-makers in Qatar showed support for the implementation of pharmacist prescribing [5]. The findings were largely positive, highlighting the potential for translation and adaptation of educational and care models to suit international contexts. Ongoing collaboration with the Qatar Supreme Council for Health is defining the education program, licensing credentials, and models of care to make Qatar the lead implementor of pharmacist prescribing in the ME.

This international work led to team members developing a €1.02 million collaborative project funded by the European Commission. This investigated best practice in prescribing and managing medicines in older, multimorbid people. Data collection spanned all EU states culminating in several publications [6] and the launch of a reference text for improving prescribing and career progression routes for pharmacist prescribers across Europe.

3. References to the research (indicative maximum of six references)

1. Weeks, G., George, J., Maclure, K., Stewart, D. (2016), Non-medical prescribing versus medical prescribing for acute and chronic disease management in primary and secondary care. Cochrane Database of Systematic Reviews, Issue 11. Art. No.: CD011227. Doi: 10.1002/14651858.CD011227.pub2.

2. Jebara, T., Cunningham, S., MacLure, K., Awaisu, A., Pallivalapila, A., Stewart, D. (2018), Stakeholders' views and experiences of pharmacist prescribing: a systematic review. British Journal of Clinical Pharmacology, 84, 1883–1905. https://doi.org/10.1111/bcp.13624.

3. Stewart D., Mair A., Wilson M., Kardas P., Lewek P., Alonso A., McIntosh J., MacLure K. SIMPATHY consortium. (2017), Guidance to manage inappropriate polypharmacy in older people: systematic review and future developments. Expert Opinion Drug Safety, 16, 203-213. Doi: 10.1080/14740338.2017.1265503.

4. Stewart, D., Thomas, B., MacLure, K., Wilbur, K., Wilby, K., Pallivalapila, A., Dijkstra, A., Ryan, C., El Kassem, W., Awaisu, A., McLay, J.S., Singh, R., Hail, M.A. (2018), Exploring facilitators and barriers to medication error reporting among healthcare professionals in Qatar using the theoretical domains framework: A mixed-methods approach. PLoS ONE 13(10): e0204987. https://doi.org/10.1371/journal.pone.0204987

5. Jebara, T., Cunningham, S., MacLure, K., Pallivalapila, A., Awaisu, A., Al Hail M., Stewart, D., (2020), Key stakeholders' views on the potential implementation of pharmacist prescribing: A qualitative investigation. Research in Social and Administrative Pharmacy. 16, 405-414. https://doi.org/10.1016/j.sapharm.2019.06.009

6. Stewart, D., Gibson-Smith, K., MacLure, K., Mair, A., Alonso, A., Codina, C., Cittadini, A., Fernandez-Llimos, F., Fleming, G., Gennimata, D., Gillespie, U., Harrison, C., Junius-Walker, U., Kardas, P., Kempen, T., Kinnear, M., Lewek, P., Malva, J., McIntosh, J., Scullin, C., Wiese, B. (2017), A modified Delphi study to determine the level of consensus across the European Union on the structures, processes and desired outcomes of the management of polypharmacy in older people. PLoS One 12(11): e0188348. 10.1371/journal.pone.0188348.

4. Details of the impact (indicative maximum 750 words)

National Impact on Population Health

A pan-European EU-funded research project (SIMPATHY) investigated best practice in prescribing in older, multimorbid people. Part of this work evaluated the Scottish Polypharmacy Guidance document, partly based on our research, as the best in Europe [C1]. This implemented a comprehensive strategy for polypharmacy management in Scotland with significant economic saving and reduction in harm. An article from 2019 highlights that, as a result of this work in Scotland, more than 120,000 inappropriate medications are being stopped each year saving money and reducing patient harm [C2]. Pharmacist prescribers play a significant role in this.

In Scotland pharmacist prescribing developed from the national Pharmacy Strategy document 'Achieving Excellence in Pharmaceutical Care'. This document stated a commitment that all patient-facing pharmacists are independent prescribing (IP). More recently our research informed the contracting of a new service in Community Pharmacy – NHS Pharmacy First Plus where IP pharmacists prescribe medicines, usually only available from a GP appointment, for common clinical conditions [C3]. This is impacting significantly by reducing GP workload and enhancing accessibility of patient to services and medicines.

The NHS Education for Scotland (NES) website [C4] evidences the value and impact of our research in informing and progressing Scottish National Pharmacist education and so making a significant contribution to this national strategy.

Through the research work a postgraduate course in pharmacist IP has been developed. In August 2019, the maximum period of accreditation for the IP course was secured [C5]. The GPhC confirmed that the course can be delivered to 200 students annually. RGU is one of only a few institutions with such a high intake. This attracts funding from NES in excess of £200,000 annually and means that the School has generated more than 1,500 professionally prescribing pharmacists over the last 10 years. This has resulted in significant impact to patient care through these IP-qualified pharmacists contributing to prescribing practice [C4]

The programme of work also led to a collaborative commission with Strathclyde University by the Scottish Government to deliver on a £400,000 study exploring pharmacy workforce issues and their contribution to General Practice workflows [C6]. A focus of this research was on the models of practice and capacity of pharmacist prescribers in the general practice setting. It showed that more than 70% were IP qualified with intentions to use this in their practice.

Impact on International Healthcare

Evidence of the impact of this work internationally in relation to prescribing in targeted populations comes from the EU-funded SIMPATHY project. Its aim was to stimulate, promote and support the development of innovations across the EU in both the management of polypharmacy and adherence in the elderly in order to deliver efficient and sustainable healthcare systems. Team

members made significant contributions to the eight-country collaboration, and a key output from this was a polypharmacy international handbook titled 'Polypharmacy Management by 2030: A Patient Safety Challenge' [C7], which was launched at the European Parliament and has been adopted across Europe and globally to inform and direct organisational policy around polypharmacy management.

Evidence of the impact of this international handbook on Scottish policy is shown by reference to it in the Scottish National Polypharmacy Guidance [C1]. In 2017, this work was publicly commended by MSP Shona Robson, Scottish Cabinet Secretary for Health and Sport, at a European conference, noting that the work would influence change in polypharmacy and lead to new strategies for the safer, more effective use of medicines for multimorbidity in ageing [C8].

Moreover, outcomes from the SIMPATHY project were integrated into the global launch [C9] of the World Health Organisation (WHO) Third Global Patient Safety Challenge - Medication Without Harm and within a linked publication [C10]. The WHO have also used this work in a globally significant publication 'Medication Safety in Polypharmacy'. In this, there is inclusion of the Scottish Polypharmacy Guidance [C1] and exemplar 'case study' materials developed from the SIMPATHY work.

This programme of work has extended its reach to cover populations beyond the elderly through a subsequent €3.5m EU funded three-year project (2019 to 2022) entitled 'iSIMPATHY'. Project partners include the Scottish Government/NHS Scotland, Northern Health & Social Care Trust / Medicines Optimisation Centre in Northern Ireland, and the Health Service Executive in the Republic of Ireland.

It is likely that iSIMPATHY will lead further national collaborations and make a significant contribution towards consolidating a single approach for polypharmacy management and multi-national compliance to the philosophy and practice of this to the benefit of patients and health services.

5. Sources to corroborate the impact (indicative maximum of 10 references)

[C1] Scottish Government Polypharmacy Model of Care Group. Polypharmacy Guidance, Realistic Prescribing. 3rd Edition, 2018. Scottish Government. Available at https://www.therapeutics.scot.nhs.uk/wp-content/uploads/2018/04/Polypharmacy-Guidance-2018.pdf [Accessed 14 March 2021].

[C2] The polypharmacy programme in Scotland: realistic prescribing. Prescriber website. Available at https://www.prescriber.co.uk/article/the-polypharmacy-programme-in-scotland-realistic-prescribing/ [Accessed 14 March 2021].

[C3] Scottish Government. Community pharmacy – national career pathway and introduction of a common clinical conditions independent prescribing service (NHS Pharmacy First Plus) NHS Circular PCA(P) (2020) 16 . https://www.sehd.scot.nhs.uk/pca/PCA2020(P)16.pdf [Accessed 14 March 2021].

[C4] NHS Education for Scotland (NES) https://www.nes.scot.nhs.uk/our-work/prescribing-and-clinical-skills/ [Accessed 14 March 2021].

[C5] General Pharmaceutical Council. School of Pharmacy & Life Sciences, Robert Gordon University Accreditation Report. https://www.pharmacyregulation.org/content/robert-gordon-ip-reaccreditation-report-august-2019-final-0 [Accessed 14 March 2021].

[C6] Stewart D, Maclure K, Newham R, Gibson-Smith K, Bruce R, Cunningham S, Maclure A, Fry S, Mackerrow J, Bennie M. A cross-sectional survey of the pharmacy workforce in general practice in Scotland. Fam Pract. 2020 ;37(2):206-212. doi: 10.1093/fampra/cmz052.

[C7] Mair A, Fernandez-Llimos F, Alonso A, Harrison C, Hurding S, Kempen T,

Kinnear M, Michael N, McIntosh J, Wilson M, The Simpathy consortium. Polypharmacy Management by 2030: a patient safety challenge, 2nd edition. Coimbra: SIMPATHY Consortium; 2017. Available from https://ec.europa.eu/chafea/health/newsroom/news/documents/polypharmacy-handbook-second-edition_en.pdf [Accessed 22 Sept 2020].

[C8] Scotland House hosts conference addressing the challenges of multi-medication in Europe's elderly. Scottish Funding Portal. Available from https://portal.funding-portal.scot/posts/2190 [Accessed 14 March 2021].

[C9] Global Launch of WHO's Third Global Patient Safety Challenge - Medication Without Harm. World Health Organisation. Available from https://www.who.int/patientsafety/policies/global-launch-medication-without-harm-Bonn/en/ [Accessed 14 March 2021].

[C10] Medication Without Harm - Global Patient Safety Challenge on Medication Safety. Geneva: World Health Organization, 2017. Licence: CC BY-NC-SA 3.0 IGO Available from: https://www.who.int/patientsafety/medication-safety/en/ [Accessed 14 March 2021].