

**Enhancing Safe Medication Practices: An
Interprofessional Education Approach**

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Statement of Originality

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to this copy of my thesis, when deposited in the University Library, being made available for loan and photocopying subject to the provisions of the Copyright Act 1968.

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I hereby certify that this thesis is in the form of a series of published papers of which I am a joint author. I have included as part of my thesis a written statement from each co-author, endorsed by the Deputy Head of Faculty (Research) and Assistant Dean Research & Research Training, attesting to my contribution to the joint publications. I have renumbered sections of submitted or published papers in order to generate a consistent presentation within the thesis.

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Dedication

This thesis is dedicated to the memory of my dad, Duncan, who believed in the value of education and provided a solid foundation that served as a springboard for high academic achievement. I wish I could have celebrated this milestone with him, but I find comfort in the knowledge that he is in a better place.

Acknowledgements

As I sit to write acknowledgments, I cannot believe I am finally at this point. When I migrated to Australia and commenced my undergraduate studies a few years ago, I had no idea where this journey would take me. Had I known, I may never have started. Nevertheless, I am glad I did and grateful for the experiences I had and the things I learned along the way. This thesis represents an end, but also a new beginning.

Firstly, I would like to express my sincere gratitude to my supervisors, Professor Tracy Levett-jones and Doctor Conor Gilligan. I could not have asked for better supervisors, they were always ready to read (and reread) my drafts at short notice and would provide valuable feedback to help me minimise the stress associated with a project of this magnitude. I will be forever grateful for their ongoing support, motivation, confidence and academic direction necessary to bring this project to completion. They demonstrated unequivocal belief in my ability and knew when to let me wander, but, also, when to redirect me towards reaching my goal. I also thank Doctor Helen Bellchambers for having been part of the supervision team in the preliminary phase of the thesis.

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This research was supported by an Australian Postgraduate Award.

Outcomes of this thesis

This thesis is submitted in the form of a series of published papers as per the University of Newcastle Rules Governing Research Higher Degrees (Rule 000830). It forms a component of a teaching and learning project, funded by the Office of Learning and Teaching, which sought to develop web-based multimedia resources to engage students with interactive and authentic 'patient journeys' and enhance their interprofessional skills related to medication practices.

The thesis is comprised of an introduction, four papers, and a final chapter providing an overall discussion of the key results. I was the first author of each of the papers and had responsibility for the study design, data collection, and analysis and manuscript preparation. Professor Tracy Levett-Jones and Doctor Conor Gilligan contributed to study design, data analysis and manuscript preparation within the capacity of their roles as PhD supervisors.

Chapter 1 introduces and justifies the study and reviews current literature related to medication safety. This is followed by a discussion of the potential for interprofessional education to enhance collaborative practice and promote medication safety. The rationale for the project and aims of each stage of the research are then detailed. Each of the four papers presented in the thesis provides further relevant background literature, methods, results, discussion and implications of the research project. At the time of submission, two papers have been published in peer-reviewed journals and two manuscripts are undergoing review. Style, structure and content of each paper are in accordance with the guidelines of each journal the papers were submitted to. While there is some repetition of literature and methods according to specific journal requirements, each chapter is preceded by an introduction that

explains how it contributes to the overall body of knowledge. The papers are listed below in the order in which they appear in the thesis.

Manuscripts in peer-reviewed journals

- Lapkin, S.,** Levett-Jones, T., & Gilligan, C. (2011). The effectiveness of interprofessional education in university-based health professional programs: A systematic review. *Joanna Briggs Institute Library of Systematic Reviews*, 9(46), 1917-1970.
- Lapkin, S.,** Levett-Jones, T., & Gilligan, C. (2013). A systematic review of the effectiveness of interprofessional education in health professional programs. *Nurse Education Today*, 33(2), 90-102.
- Lapkin, S.,** Levett-Jones, T., & Gilligan, C. (2011). A cross-sectional survey examining the extent to which interprofessional education is used to teach nursing, pharmacy and medical students in Australian and New Zealand universities. *Journal of Interprofessional Care*, 26(5), 390-396.
- Lapkin, S.,** Levett-Jones, T., & Gilligan, C. (2013). Development and testing of the Theory of Planned Behaviour Medication Safety Questionnaire. Manuscript submitted for publication (*Nurse Education Today Journal*).
- Lapkin, S.,** Levett-Jones, T., & Gilligan, C. (2013). The effectiveness of web-based interprofessional learning resources on health professional student's behavioural intentions in relation to medication safety: A quasi-experimental study. Manuscript submitted for publication (*Focus on Health Professional Education: A Multi-disciplinary Journal*)

Conference presentations [Abstracts are provided in Appendix A].

- Lapkin, S.,** Levett-Jones, T., & Gilligan, C. (2012, November). *The effectiveness of web-based interprofessional learning resources on health professional student's behavioural intentions in relation to medication safety: A quasi-experimental study*. Paper presented at the Interprofessional Education for Medication Safety Symposium, Newcastle, Australia.
- Lapkin, S.,** Levett-Jones, T., & Gilligan, C. (2012, October). *The effectiveness of interprofessional education in university-based health professional programs: A systematic review*. Paper presented at the All Together Better Health VI (ATBHVI) conference, Kobe Gakuin University, Kobe, Japan.
- Lapkin, S.,** Levett-Jones, T., & Gilligan, C. (2012, October). *A cross sectional survey of interprofessional education in Australian and New Zealand health professions programs*. Paper presented at the All Together Better Health VI (ATBHVI) conference, Kobe Gakuin University, Kobe, Japan.
- Lapkin, S.,** Levett-Jones, T., & Gilligan, C. (2012, October). *Measuring health professional student's intention to behave in a way that promotes medication safety using the Theory of Planned Behaviour*. Paper presented at the All Together Better Health VI (ATBHVI) conference, Kobe Gakuin University, Kobe, Japan. 938

Additional publications associated with thesis [Appendix B]

Lapkin, S., Levett-Jones, T., Bellchambers, H., & Gilligan, C. (2010). Systematic review protocol 487: The effectiveness of interprofessional education in university based health professional programs: *A systematic review*. *Joanna Briggs Institute Library of Systematic Reviews* 1-19.

Levett-Jones, T., Gilligan, C., **Lapkin, S.**, & Hoffman, K. (2012). Interprofessional education for the quality use of medicines: Designing authentic multimedia learning resources. *Nurse Education Today*, 32(8), 934-938.

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List of Abbreviations

IPE: Interprofessional Education

TPB: Theory of Planned Behaviour

TPB-MSQ: Theory of Planned Behaviour Medication Safety Questionnaire

Abstract

This thesis by publication reports on four interconnected research stages that explore the effectiveness of university based interprofessional education (IPE) in relation to medication safety. At the time of submission, two papers have been published in peer-reviewed journals and two manuscripts are undergoing review.

It is widely accepted that health professional students who learn together will be better prepared for contemporary practice and more able to work collaboratively and communicate effectively. In Australia, IPE is recognised as important for preparing nursing, pharmacy and medical students for their roles in the medication team. Evidence indicates that inadequate communication between health care professionals is the primary issue in the majority of medication errors. Despite this, IPE is seldom used for teaching medication safety.

This project began with a literature review exploring issues of IPE as they relate specifically to medication safety. This was followed by a systematic review to appraise and synthesise the best available evidence on the effectiveness of IPE in university based health professional programs. Few rigorously evaluated studies of IPE were found, indicating an inadequate evidence base to inform future activities, particularly in relation to medication safety. A cross-sectional survey of IPE in Australian and New Zealand Universities reinforced these findings, with respondents reporting few examples of true IPE, a lack of structured and integrated IPE activities, and few links to student assessment. The pragmatic challenges associated with evaluating behavioural outcomes of educational activities, as well as timetabling and inadequate resources, were identified as key challenges to the systematic implementation and evaluation of IPE.

In an effort to address some of these barriers the Theory of Planned Behaviour Medication Safety Questionnaire (TPB-MSQ) was developed to assess nursing, medical and nursing students' behavioural intentions in relation to medication safety

as a proxy for actual behaviour change. Pilot-testing proved the questionnaire to be a valid and reliable instrument for evaluating students' behavioural intentions. The questionnaire was subsequently used in a quasi-experimental study to examine the effectiveness of a web-based module incorporating IPE and communication as strategies to promote medication safety. Students who were exposed to the web-based module demonstrated significantly greater intention to practice in a way that enhances medication safety and collaborative practice than those who were not, as evidenced by higher scores on the TPB-MSQ.

Taken together, the findings presented in this thesis provide evidence to support the use of web-based learning modules which incorporate IPE as an innovative approach to promote patient safety. Web-based IPE offers health professional students an opportunity to learn about and from other disciplines even when they do not have the opportunity to learn with them. However, further research is necessary to explore the transferability of the acquired behaviours into clinical practice and the impact of these on medication related patient outcomes such as length of stay and medication incidents.