The effectiveness of web-based interprofessional learning modules on health professional student's behavioural intentions in relation to medication safety: A quasi-experimental study

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Background

- Safe medication practices are a key focus of the global strategy to improve patient safety [1]
- In Australia medication adverse events cost approximately $6 billion dollars per year and inappropriate use of medicines $380 million [2]
- National Health Service in the UK and the Institute of Medicine [3] in the US report similar figures
- The National Medicines Safety and Quality Scoping Study Steering Committee and WHO specifically advocates for the inclusion of safe medication practice in curricula for all health professionals [1, 2]

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Background continued…

- Safe, timely, and efficient use of medicines- interprofessional process [6]
- Collaborative skills such mutual understanding of others' roles can enhance medication safety practices [7, 8]
- Undergraduate health professional education is mainly delivered in a discipline specific mode
- Ideally, collaborative skills are best learned when students from various professions in 'real' healthcare contexts through structured and facilitated interprofessional learning experience during clinical placement [9]
- Opportunities for this to occur in a systematic way are limited by
  - Reduced clinical placement availability
  - Large numbers of students [10]

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Background continued…

- Improvements IPE related learning outcomes have reported in IPE experiences that involve didactic methods such as case studies, workshop and seminar formats [5, 11, 12]
- Pragmatic constraints inherent in university programs
  - timetabling restrictions
  - rigid curricular
  - balancing of students numbers
  - lack of physical space limit [13]
- **Online approaches**
  - less cost
  - fewer logistical issues compared to in face-to-face IPE experiences
  - potential to address some of these barriers

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Background continued…

- Other IPE studies have used online approaches [14, 15]
- **Limitations:**
  - Small sample sizes
  - Outcomes were not evaluated in reliable way
  - Measures of satisfaction and attitudinal changes post intervention
  - One group design- no control
- Unclear if the gains in can translate to changes in clinical behaviour of health professional [16]
- Challenge: rigorous evaluation of IPE experiences

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Study Aim

The present study sought to examine the impact of web-based interprofessional learning modules on health professional student's behavioural intentions in relation to medication safety and collaborative practice

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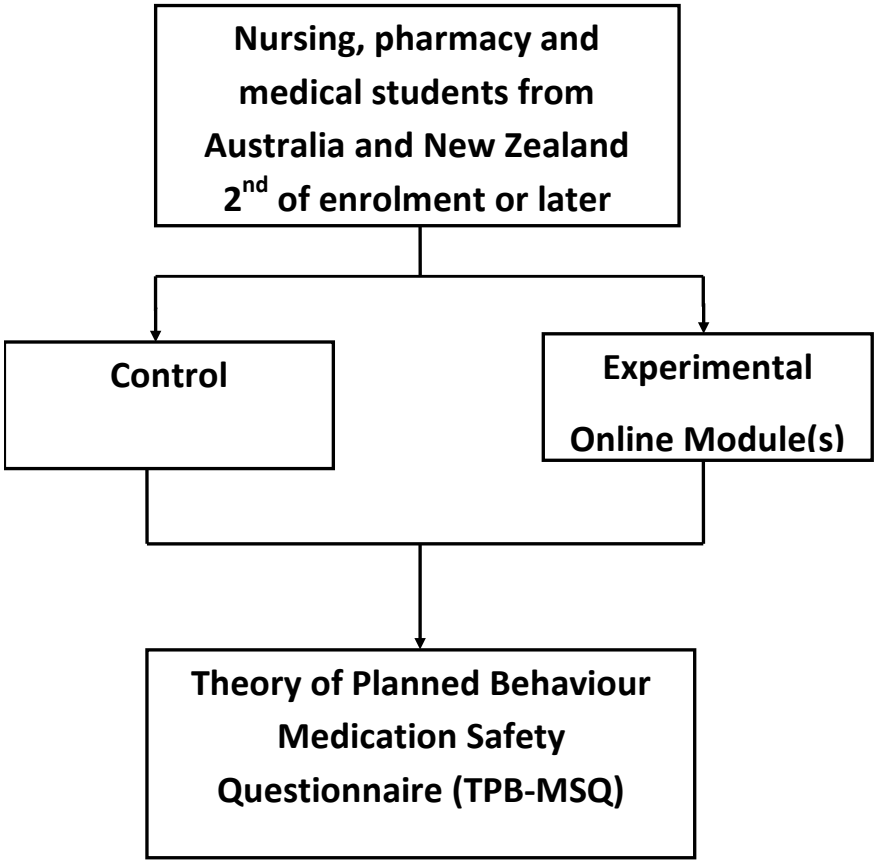
Study Design



Intervention

- Three multimedia-learning modules
- Combination of digital video, audio and text
- Addresses medication safety and interprofessional collaborative practice
- Series of system and human errors resulting medication incidents
  - Poor communication
  - Ineffective team-working
  - Not following policies and guidelines

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Intervention continued…

- Adapted from coroner's report
- Depicts a 65 year-old male was brought to the ED following MVA
  - Internal fixation of fracture
  - Pre-operative orders did not include chemical or mechanical venous thromboembolism (VTE) prophylaxis
  - Circulation observations and pneumatic calf compression were performed during surgery
  - No post-operative orders for obs and VTE
  - Demonstrations of positive and negative behaviours
  - VTE guidelines and protocols [17]
  - Critical thinking questions

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Outcome measures

- Behavioural intentions measured using the Theory of Planned Behaviour Medication Safety Questionnaire (TPB-MSQ) [18]
- **The TPB-MSQ**
  - Four parallel profession specific scenarios
  - 56 items predictor variables of TPB
  - 7-point Likert scale-1 (strongly disagree) to 7 (strongly agree)
  - Higher scores -stronger intention to perform the target behaviour
  - Participants' demographics

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Outcome measures continued…

Targeted Behaviours

- **Scenario 1:**
  - Leadership and Management
  - Problem Solving and Decision Making
  - Teamwork and Cooperation
- **Scenario 2:**
  - Person-Centered Care
- **Scenario 3:**
  - Adherence to Guidelines
  - Documentation
  - Communication and interaction
- **Scenario 4:**
  - Situational Awareness
  - Teamwork and Cooperation

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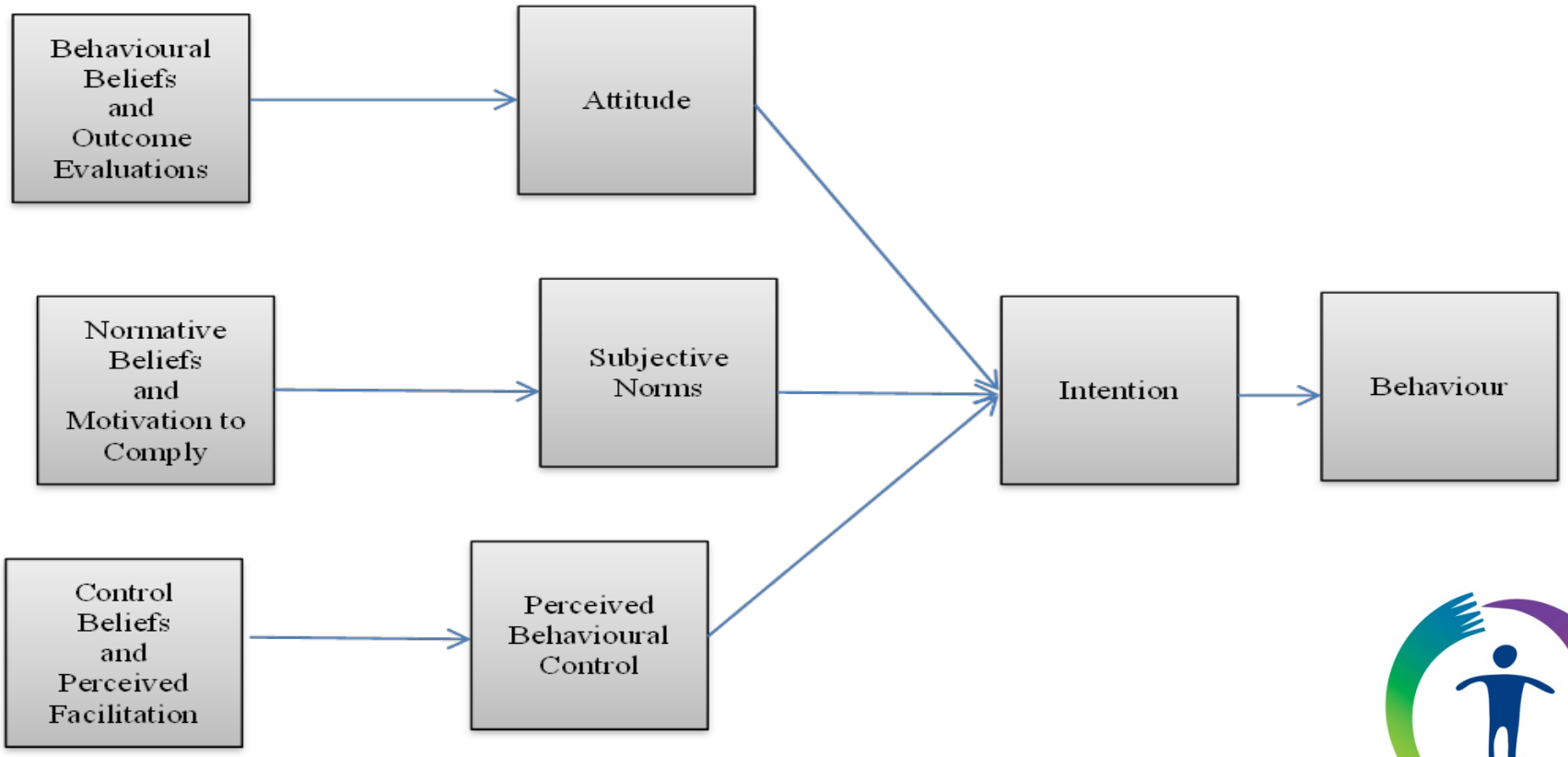
Theory of Planned Behaviour

Figure I: Theory of Planned Behaviour



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Development of TPB-MSQ continued…

- Guidelines for the construction of TPB questionnaires [19]
- Essential elements of questionnaire design and development [20]
- Elicitation focus group interviews with 68 recent health professional graduates study
- Content validity of the questionnaire by an expert panel
- Reliability analyses conducted with a sample of nursing, medicine and pharmacy undergraduate students

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Development of TPB-MSQ

Table 1: Direct measures of the Theory of Planned Behaviour

TPB construct	Number of items	Sample item	Cronbach's alpha (α)	Mean
Attitude	15	Reviewing the factors that contributed to this medication incident is the responsibility of a senior member of staff	.659	5.39
Subjective norm	12	My colleagues would expect me to take the initiative for reviewing the factors that contributed to this medication incident	.650	5.23
Perceived behaviour control	14	It is my role to inform patients or a member of their family if a medication incident occurs	.816	5.02

The reliability of the entire questionnaire scale: 0.889.

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Results

Participants

320 undergraduate health professional students

- **11 universities**
- **Nursing 89% (n= 284)**
- **Medicine 6% (n=16)**
- **Pharmacy 5% (n=15)**

Table 2: Demographics of the participants (N= 320)

Demographic Characteristic	Control (n=165)	Experimental (n=155)	Significance
Gender			
Male	14	20	Chi-square (1)= 0.98, *p* = 0.754
Female	96	122	
Previous IPE Experience			
No	86	104	Chi-square (1)= 0.567, *p* = 0.451
Yes	23	35	

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Results

Table 3: Effects of module on TPB variables

Variable	Control (N= 144) (Mean ± SD)	Experimental (N= 148) (Mean ± SD)	*t*-test for equality of means		
			t	df	Sig. (2-tailed
Intention	2.93± 1.15	3.47 ± .77	-4.723	290	0.000
Attitude	5.27 ± .61	5.55 ± .51	-4.203	290	0.000
Perceived behavioural control	5.12 ± .73	5.25± .67	-1.616	290	0.107
Subjective norm	5.36 ±.64	5.48 ± .63	-1.579	290	0.115

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Limitations of the study

- An unequal distribution of nursing, medical and pharmacy students- **multiple reminders**
- Sampling bias convenience samples: **students from multiple universities and baseline comparison**
- Self-reports as measures of behaviour: **assured participants confidentiality**

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Implications for further research

- Longitudinal study
- Web-based IPE experiences provide innovative solution
  - Effective
  - Convenient
  - Simple to administer
  - Can reach a significant number of participants
  - Data collection can occur as part of the intervention process
  - Cost effective

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Conclusion

- Experimental group had stronger intentions to behave in a way that enhances medication safety
- The intervention was designed to change underlying behavioural, normative, and control beliefs that are known to impact on behavioural intentions related to medication safety and collaborative practice
- Attitudinal changes are similar to those obtained by face-to face IPE experiences
- Present study has gone further than studies which simply evaluate student's attitudes and perceptions towards interprofessional collaboration
- Instrument used for outcome measures was designed to evaluate behaviour of health professional students
- Evidence of behavioural change in relation to medication safety and collaborative practice

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http://www.ipeforqum.com.au/people/project-team/

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