Using e-learning and the theory of planned behaviour to predict Australian primary health care nurses' behavioural intentions in Chronic Kidney Disease screening practices

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Declarations

Statement of Originality

I hereby certify that the work embodied in the thesis is my own work, conducted under normal supervision. The thesis contains no material which has been accepted, or is being examined, 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. I give consent to the final version of my thesis being made available worldwide when deposited in the University's Digital Repository, subject to the provisions of the Copyright Act 1968 and any approved embargo.

Peter Sinclair

Thesis by Publication

I hereby certify that this thesis is in the form of a series of papers. I have included as part of the thesis a written statement from each co-author, endorsed in writing by the Faculty Assistant Dean (Research Training), attesting to my contribution to any jointly authored papers.

Statement of Contribution

By signing below I confirm that **Peter M. Sinclair** contributed to the conceptualisation, design, analysis, interpretation and writing the draft of the publication entitled:

Sinclair, P.M., Kable, A., & Levett-Jones, T. (2015). The effectiveness of e-learning on clinician behaviour and patient outcomes: A systematic review protocol. *JBI Library*, 13(1), 52-64

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Professor Liz Sullivan Date: 13/5/19
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List of publications included as part of this thesis

Chapter 2

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Chapter 7

Sinclair, P.M., Kable, A., Levett-Jones, T., Holder, C., & Oldmeadow, C. (in press). An evaluation of general practice nurses' knowledge of chronic kidney disease risk factors and screening practices following completion of a case study based asynchronous e-learning module. *Australian Journal of Primary Health*. Accepted May 8, 2019

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Abstract

The aim of this thesis by publication was to design and evaluate an intervention that sought to improve Australian general practice nurses intention to initiate a kidney health check on people who are at risk of Chronic Kidney Disease. Five papers have been published in peer reviewed journals and the sixth paper was accepted for publication on May 8, 2019.

Opportunistic screening in the general practice setting plays an integral role in the early detection and subsequent management of chronic kidney disease. However, there are significant deficits in current screening practices, despite early identification being a national kidney health priority. Consequently, there is a need to identify strategies to improve screening practices. One potential approach is to educate general practice nurses about CKD screening. Yet, equitable access to professional development opportunities, particularly for nurses in rural and remote communities, can be challenging. E-learning presents a potential solution to this issue.

An exploratory-sequential mixed methods design with a three phase approach was used for this program of work. Phase one consisted of a systematic review which identified, appraised and synthesised the best available evidence for the effectiveness of e-learning programs on healthcare professional behaviour and patient outcomes. The review identified that e-learning was at least equivalent to traditional learning approaches and superior to no instruction at all, when evaluating the effectiveness of e-learning on teaching skills (i.e. behaviour).

Phase two of the study was informed by the Theory of Planned Behaviour and sought to identify the barriers and facilitators to opportunistic CKD screening by general practice nurses through an elicitation study. Barriers were found to be complex, multi-factorial and driven by social and organisational factors. The financial costs associated with non-claimable services, regardless of patient

benefit, were hard to justify in a private business environment. This phase assisted in the development of the intervention and its associated instruments in phase three of this program of work.

In the third and final phase of this study, a parallel group, double blind randomised controlled trial design was used to evaluate the effectiveness of an asynchronous web-based e-learning module on general practice nurses' (n = 420) behavioural intentions in relation to opportunistic screening practices for people at risk of chronic kidney disease. Participants were randomised to a targeted behavioural e-learning program (Intervention) or a knowledge based e-learning program (Active control). It also evaluated the effectiveness of an asynchronous web-based e-learning module on general practice nurses' knowledge about chronic kidney disease risk factors and screening practices. Finally, it evaluated participants' perceived satisfaction with the e-learning module. This trial was called the CKD-DETECT study.

The intervention was designed to influence the behavioural constructs of the Theory of Planned Behaviour namely attitude, subjective norm and perceived behavioural control. Data analysis determined that there were no significant differences in behavioural intention between the intervention and control groups at follow-up, when controlling for baseline values. These results were replicated in a modified intention to treat analysis.

Regression models were used to examine the relationship between the change in the Theory of Planned Behaviour constructs and intentions at follow-up for *all* participants in the CKD-DETECT study. Irrespective of study arm, completing the study had an equivalent effect on all participants. A significant change was identified for all behavioural constructs and intention (sum). These changes were not attributed to the effect of the intervention. Attitude and perceived behavioural control models accounted for approximately 35% of the explained variance in behavioural intentions, and subjective norm accounted for

approximately 33% of the variance. The inclusion of all theoretical constructs, explained 37% of the variance in intention.

Changes in CKD knowledge were assessed using a pre-test post-test evaluative design and satisfaction scores were measured on completion of the module. Participants' baseline knowledge scores were poor, with mean pre-test scores of 3.77 [SD 1.66] out of ten. Post test scores revealed a significant improvement (mean difference 1.81, [95% CI: 1.53 – 2.09] $p < .01$), however overall final scores remained inadequate.

The CKD-DETECT trial used a purpose developed satisfaction instrument which evaluated participants' satisfaction with undertaking the e-learning module/s and their instructional design elements, particularly course design delivery. Participants in the CKD-DETECT trial rated their satisfaction with the design of the e-learning modules used as high.

This program of work was the first study to identify the barriers and facilitators of screening and evaluate an intervention specifically designed to target participants' attitudinal, normative and control barriers to chronic kidney disease screening. While this program of work achieved its stated aims, it produced mixed results. The results provide a persuasive argument for further investment and work in improving knowledge and behavioural intention to initiate opportunistic screening in the general practice setting so that we can reduce disease-related morbidity and mortality, through the early detection of people with chronic kidney disease.

Glossary

Acronym	Full description
APNA	Australian Primary Health Care Nurses Association
CKD	Chronic Kidney Disease
CONSORT	Consolidated Standards of Reporting Trials
EFA	Exploratory Factor Analysis
e-learning	Electronic Learning
GP	General Practice
GPN	General Practice Nurse
HCP	Health Care Professional
HREC	Human Research Ethics Committee
I-CV	Items Content Validity
KE-I	Knowledge Evaluation Instrument
LSAe-L	Learner Satisfaction with Asynchronous e-Learning (Instrument)
PPI	Potential Problematic Items
RN	Registered Nurse
RCT	Randomised Controlled Trial
RA	Research Assistant
SME	Subject Matter Expert
S-CV	Survey(Scale) Content Validity
TPB	Theory of Planned Behaviour
TPB-CKDISI	Theory of Planned Behaviour Chronic Kidney Disease Identification and Screening Questionnaire
UON	University of Newcastle