Effectiveness of Educational Interventions on the Research Literacy of Post-Registration Nurses: A Systematic Review

Sonia Hines[1,2], Joanne Ramsbotham[2], Fiona Coyer[2].

1.Nursing Research Centre & Queensland Centre for Evidence-based Nursing and Midwifery, A Collaborating Centre of the Joanna Briggs Institute.

2. Queensland University of Technology

Disclosure

I have no known conflicts of interest to declare. Partial funding was received in the form of a scholarship provided by the Australian College of Nursing for the conduct of my PhD, however the funding body have had no influence or input into the findings. My employer, Mater Health Services (a non-profit organization), has had no influence or input into these findings.

Learner Objectives: By the end of this presentation attendees will have a beginning understanding of the evidence on effective interventions for improving nurses' research literacy.

Background

- *Research literacy is required of nurses by most registering bodies around the world*
- *Most university/college nursing courses include some research education*
- *Yet registered nurses still struggle to use research in practice and explicitly report difficulties with reading & understanding research*

Background

- *The ability to read and understand research (ie 'research literacy') is essential for translating research to practice*
- *Difficulty with reading and understanding research is often cited as a reason nurses don't translate research to practice & don't use evidence in practice*
- *If we can understand how to improve research literacy, it could be an important first step to improving research use in practice*

Review Objectives

We aimed to identify the effectiveness of workplace, tertiary-level educational or other interventions designed to improve or increase post-registration nurses' understanding of research literature and ability to critically interact with research literature with the aim of promoting the use of research evidence in practice.

Review Methods

- *Standard Joanna Briggs Institute systematic review methods used*
- *Methods pre-specified in published protocol*
- *Extensive searches of multiple databases (Medline, CINAHL, Web of Science, EMBASE, ERIC, trial registry sites and grey literature sources.*
- *Two reviewers verified congruity of studies to inclusion criteria*
- *Two reviewers assessed risk of bias of articles using a validated critical appraisal tool*
- *Two reviewers extracted data from the included studies*

Inclusion Criteria

Study designs: ***randomised controlled trials, quasi-experimental trials, & pre-test/post-test studies (single or multiple groups)***

Participants: ***post-registration registered nurses working or studying in any healthcare or educational setting***

Interventions: ***any style or structure of educational program, in a workplace or educational institution, conducted with the aim to improve participants' understanding of research literature***

Outcomes: ***research knowledge or understanding, ability to critically appraise research, use of research evidence in practice, & self-efficacy, preferably measured by a validated tool.***

Search Results

Searches
- 4545 potentially relevant papers from all searches

Sifting
- After checking titles and abstracts for potential relevance to review, 96 papers were selected for retrieval

Verifying
- When the full versions examined, 10 of the 96 retrieved papers were found to fully meet the inclusion criteria

Critical Appraisal
- 10 studies met the quality criteria & were included in the review

Data Analysis
- No meta-analysis was possible with the available data

Findings

- *Level of evidence overall was low to moderate*
- *Most included studies (n=7) were single group pre-test/post-test, but also one 2-group post-test & 2 quasi-experimental studies.*
- *Studies were from UK, USA, Taiwan, Japan, Hong Kong, Australia, Spain*
- *Studies were done in healthcare facilities (n=4) & universities (n=6)*

Workplace learning

- *Four studies with 106 participants examined the effectiveness of interventions delivered in a workplace environment*

- *Interventions were: one-day workshop (Chang et al., 2013), a six-week 'virtual journal club' online program (Billingsley et al., 2013), a six-week research knowledge course (Swenson-Britt & Reineck, 2009), and a six-month clinical fellowship program that included the supported conduct of a research implementation project (Ecoff, 2009).*

Workplace learning

- *Length of intervention and format (online or in-person) had no apparent relationship with effectiveness*

- *All four studies reported statistically significant improvements in EBP knowledge, critical appraisal ability and/or research self efficacy (p=0.03 to 0.0001)*

- *One study comparing experiential learning to traditional lectures (Liou et al., 2013) reported high levels of effectiveness for their interactive intervention in terms of objectively measured research knowledge (p<0.01)*

University learning

- *Six studies with 427 participants examined the effectiveness of university courses for improving research knowledge & critical appraisal skills*

- *Overall, self-directed study using online materials not especially adapted or designed for the purpose was no more effective than attending interactive lectures and participating in group work (Morris, 1999) or attending traditional lectures (Woo & Kimmick, 2000)*

- *Where online learning was interactive & activity-based & designed for the purpose (Reviriego et al., 2014; Liou et al., 2013) it was highly effective (P<0.001, both)*

What factors make a difference?

Course format:

- *Five studies with 304 participants reported data on face-to-face interventions and their effect on research and/or EBP knowledge and skills. Two studies with 106 participants examined face-to-face learning and reported on critical appraisal skills*
- *Online was no more or less effective than face-to-face learning, except when the online course was identical to the in-person content (eg filmed or live lectures uploaded or broadcast online) – this was not effective*
- *In-person lectures were more effective than online in studies where the online work was self-directed, particularly where the in-person content had more opportunities for interactivity*

What factors make a difference?

Course design:

- ***Interactivity was the clearest factor across all studies. Studies where the intervention was clearly & explicitly interactive showed evidence of an effect more often***

- ***Group work, role play, research simulation activities, supported research implementation, virtual journal clubs were all used with effect reported in research knowledge, critical appraisal ability &/or research self-efficacy***

- ***Group work also showed a persistent effect on research knowledge when measured one semester post end of the course***

What factors make a difference?

Theoretical framework:

- ***Five of the included studies reported using a theory to construct or design their interventions***
- ***All five studies reported significant effects***
- ***Adult learning theory (Billingsley et al., 2013), social learning theory (Chang et al., 2013), Rogers' diffusion of innovation theory (Ecoff, 2009), Astin's input-environment-outcome theory (Liou et al., 2013), and Bandura's social cognitive theory (Swenson-Britt & Reineck, 2009)***

Conclusions

- *Low to moderate evidence from 10 studies with no pooling of data due to large methodological diversity between studies*
- *Statistically significant findings reported in studies using interactive or group-based learning whether online or face-to-face*
- *No difference between online and in-person interventions of the same design*

Conclusions

- *Possible that using an appropriate theory to frame the intervention can improve effectiveness – supported by research from other professions*
- *Many of these findings are not 'new' to the educational literature*
- *The evidence for interactive educational strategies is well known, not only for research education*
- *Didactic teaching strategies still persist across educational institutions and workplaces*

Implications for Research

- *Future research needs to be more rigorous, use experimental methods, & be adequately powered to detect an effect*

- *Although nurses often identify their difficulty with research as a difficulty with "understanding the language", no studies were found that used language teaching strategies to improve nurses' research literacy*

- *It is possible that approaches which address research literacy using literacy approaches could be more effective*

Included Studies

Billingsley, L., Rice, K., Bennett, M., & Thibeau, S. (2013). Using a Multiuser Virtual Environment to Facilitate Nursing Journal Clubs A Mixed-Methods Study. Clinical Nurse Specialist, 27(3), 146-154.

Chang, S., Huang, C., Chen, S., Liao, Y., Lin, C., & Wang, H. (2013). Evaluation of a critical appraisal program for clinical nurses: A controlled before-and-after study. Journal of Continuing Education in Nursing, 44(1), 43-48.

Ecoff, L. A. (2009). An educational initiative to promote evidence-based practice. 3368212 Ph.D., University of San Diego, Ann Arbor. ProQuest Dissertations & Theses Global database.

Jones, S. C., Crookes, P. A., & Johnson, K. M. (2011). Teaching critical appraisal skills for nursing research. Nurse Education in Practice, 11(5), 327-332. doi: 10.1016/j.nepr.2011.03.002

Liou, S. R., Cheng, C. Y., Tsai, H. M., & Chang, C. H. (2013). Innovative strategies for teaching nursing research in Taiwan. Nursing Research, 62(5), 335-343.

Morris, J. (1999). Evaluation of open learning material designed for part of the diploma level research module for pre- and post-registration nurses. Nurse Education Today, (8), 601-609.

Reviriego, E., Cidoncha, M., Asua, J., Gagnon, M. P., Mateos, M., Garate, L., . . . Gonzalez, R. (2014). Online training course on critical appraisal for nurses: adaptation and assessment. BMC Medical Education, 14.

Swenson-Britt, E., & Reineck, C. (2009). Research education for clinical nurses: a pilot study to determine research self-efficacy in critical care nurses. Journal of Continuing Education in Nursing, 40(10), 454-461.

Tsugihashi, Y., Kakudate, N., Yokoyama, Y., Yamamoto, Y., Mishina, H., Fukumori, N., . . . Fukuhara, S. (2013). A novel Internet-based blended learning programme providing core competency in clinical research. Journal Of Evaluation In Clinical Practice, 19(2), 250-255.

Woo, M. A., & Kimmick, J. V. (2000). Comparison of Internet versus lecture instructional methods for teaching nursing research. Journal of Professional Nursing, 16(3), 132-139.