

Review Article

What is the evidence that poster presentations are effective in promoting knowledge transfer? A state of the art review

Dragan Ilic* & Nicholas Rowe†

*Department of Epidemiology & Preventive Medicine, School of Public Health & Preventive Medicine, Monash University, Melbourne, Vic., Australia, and †Independent Academic, Pello, Finland

Abstract

Background: Poster presentations are a common form of presenting health information at conferences and in the community. Anecdotal evidence within the discipline indicates that health information framed in a poster presentation may be an effective method of knowledge transfer.

Objectives: A state of the art review of the literature was performed to determine the effectiveness of poster presentations on knowledge transfer.

Methods: Electronic searches of various electronic databases were performed for studies published until 2012. Studies were eligible for inclusion if they provided empirical data on the effectiveness of poster presentations on changes in participant knowledge, attitude or behaviour.

Results: A total of 51 studies were identified through the database searches, of which 15 met the inclusion criteria. No study evaluated the effectiveness of posters in comparison with other educational interventions. Most studies utilised a before/after methodology, with the common conclusion that posters elicit greatest effectiveness in knowledge transfer when integrated with other educational modalities.

Conclusions: The poster presentation is a commonly used format for communicating information within the academic and public health fields. Evidence from well-designed studies comparing posters to other educational modalities is required to establish an evidence base on the effectiveness of utilising posters in achieving knowledge transfer.

Keywords: continuing education, health promotion, knowledge transfer, poster presentations, systematic review

Key Messages

- Poster presentations achieve success in increasing knowledge, changing attitudes and behaviour when integrated with a suite of educational interventions.
- Although superficial, the graphical design and physical appearance of the poster can determine its success in promoting knowledge transfer.
- There is no study that directly compares the effectiveness of poster presentations to other educational interventions in achieving knowledge transfer.
- Given their common use within the academic and public health fields, there is a need for comparative studies to assess the effectiveness of posters in knowledge transfer as the first step in establishing an evidence base on this topic area.

What is knowledge transfer?

The discipline of knowledge transfer, or knowledge translation, has gained prominence in medical literature and has direct application to a variety of disciplines including medicine, public health and health services research and policy.¹ Knowledge transfer may be deemed to consist of any process that promotes the transfer of evidence into the aforementioned disciplines. This may include the exchange, synthesis or application of knowledge within a complex system of interactions between researchers and end-users.²

Knowledge translation aims to integrate continuing medical and health services education, professional development and quality improvement in order to close the research-to-practice gap.³ Closing the research-to-practice gap is a complex process, with different stages of process being subject to different barriers. In order for research to reach the end-user in practice, users need to be aware of, agree, adopt and finally adhere to the evidence.⁴ The rate of compliance with evidence-based recommendations significantly decreases across these four stages due to a variety of barriers including knowledge, attitudes, beliefs, time and skills.⁴ Whilst the presentation of evidence in peer-reviewed medical and healthcare journals, conferences and/or continuing medical education (CME) seminars assist in the dissemination of information, it does not necessarily result in the modification of knowledge, attitudes or behaviour.^{5,6} Similar barriers are apparent when public health campaigns aimed at modifying patient, and consumer knowledge and behaviour are implemented on a mass scale.⁷

Posters as a means of knowledge transfer

Novel research knowledge is generally presented at professional conferences, prior to publication in peer-reviewed journals. Such conferences often provide a forum in which health professionals and researchers both obtain and maintain their currency of knowledge. Conferences and seminars commonly consist of oral and poster presentations. Oral presentations are usually allocated a 10–15-minute timeslot, in which detailed information is generally presented in a didactic format.

Poster sessions are commonly organised at conferences to accommodate the large number of delegates who would like to present research findings, but would otherwise be prevented from doing so due to the limited time available for oral presentation.⁸

Poster presentations are beneficial to conference organisers, authors and delegates in several domains. At first glance, posters themselves seem relatively inexpensive to produce, given that they can provide the audience with information that can be viewed by a number of individuals at their own pace.^{8–10} Posters provide the viewer with a concise overview of the project/topic, which may often be supplemented by informal discussion with the author. Commonly, conferences are providing authors with time to present a short oral presentation (<5 minutes) to accompany the poster during dedicated poster-only sessions. When delivered in combination with a short presentation or author presence, the poster presentation can facilitate informed discussion between the presenter and audience.^{8,11} This combined process may be more engaging, and a means by which the poster presentation can promote active learning. Additionally, such discussion and networking opportunities are often the catalyst for future collaborative efforts, and add to the overall objectives of conference attendance.^{12,13}

Are poster presentations an effective method of knowledge transfer?

Despite a growing body of literature on the development, implementation and effectiveness of knowledge translation, little data exist which evaluate the poster medium. A systematic review assessing the impact of CME (including conferences) identified that CME activities may increase participants' knowledge and skills and also promote changes in attitude.⁶ Importantly, however, it was concluded that strictly didactic oral presentations do not alter the participants' performance or post-conference behaviours.⁶ Given the push for effective knowledge translation and the common use of the poster presentation, an information gap exists to identify how effective the poster presentation is in promoting knowledge transfer, given in its widely used format.

Objectives

The objective of this state of the art review of the literature was to empirically determine the effectiveness of poster presentations on knowledge transfer in health professionals and consumers. Specific aims included evaluating the impact of information presented by poster presentation on changes in knowledge, attitudes and behaviour – key elements of effective knowledge transfer.

Methods

The methodology for a state of the art review aims for a comprehensive search of the literature.¹⁴ It does not include a formal quality assessment process. It aims to synthesize the current state of knowledge and prioritise for future research and investigation.

Criteria for considering studies within this review

All studies that assessed the effectiveness of poster presentations on knowledge transfer, as determined by changes in knowledge, attitudes and behaviour in health professionals and/or consumers, were eligible for this review. Studies that used any form of information provision via the poster medium (be it paper based or electronic) were eligible for inclusion.

Search strategy for the identification of studies

Electronic searches of the MEDLINE, Allied and Complementary Medicine, PsycINFO, ERIC and Cochrane Database of Systematic Reviews were conducted in September 2012, for studies published between 1946 and 2012. There was no restriction on language. The search strategy was adapted for each electronic database (Table 1).

Selection of studies

Both authors looked to independently select eligible studies against a pre-determined checklist of inclusion criteria. Studies were initially categorised as:

- Possibly relevant – studies that met the inclusion criteria and studies from which it was not

Table 1 Search terms and search strategy

1. Education, Medical, Undergraduate/or Education, Dental, Continuing/or Education, Graduate/or Education/or Education, Pharmacy/or education.mp. or Education, Pharmacy, Graduate/or Competency-Based Education/or Education, Nursing, Baccalaureate/or Health Education/or Education, Nursing, Graduate/or Education, Medical, Continuing/or Education, Professional, Retraining/or Education, Nursing/or Education, Nursing, Continuing/or Education, Nursing, Diploma Programs/or Education, Public Health Professional/or Education, Medical/or Health Education, Dental/or Education, Professional/or Education, Medical, Graduate/
2. medical education.mp. or Education, Medical/
3. health education.mp. or Health Education/
4. biomedical education.mp.
5. health promotion.mp. or Health Promotion/
6. poster.mp. or Posters as Topic/
7. poster presentation\$.mp.
8. Knowledge/or Health Knowledge, Attitudes, Practice/or Information Dissemination/or knowledge transfer.mp.
9. 1 or 2 or 3 or 4 or 5
10. 6 or 7
11. 8 and 9 and 10

possible to determine whether they met the criteria either from their title or abstract

- Excluded – those clearly not meeting the inclusion criteria

If a title, or abstract, appeared to meet the eligibility criteria for inclusion of the review, or we could not tell, a full text version of the article was obtained and assessed by the two authors to determine whether it met the inclusion criteria.

Results

A total of 51 studies were identified through the database searches, of which 15 met the inclusion criteria (Table 2). Six of the studies evaluated the poster format as a standalone intervention, six integrated the poster as part of a multi-modal educational intervention, one study trialled different versions of the poster presentation and two studies reported on user experience and opinions on poster presentations (Table 3). All posters were implemented across different clinical/health topics and settings.

Studies that reported on the effectiveness of the poster presentation as a standalone intervention

Table 2 Studies identified in search of literature

Study	Reason for inclusion/exclusion
Hertrampf <i>et al.</i> ³³	Intervention was not a poster presentation
Rowe & Ilic ²⁸	Article on how to construct a poster
Kao <i>et al.</i> ³⁴	Focus of the paper was not on poster presentations and knowledge transfer
Kelsch & Werremeyer ³⁵	Focus of the paper was not on poster presentations and knowledge transfer
Williams & Bethea ²⁷	Included
Klimes-Dougan & Lee ³⁶	Focus of the paper was not on poster presentations and knowledge transfer
McDonnell ³⁷	Focus of the paper was not on poster presentations and knowledge transfer
Kearns <i>et al.</i> ³⁸	Focus of the paper was not on poster presentations and knowledge transfer
Goldman & Schmalz ³⁹	Article on how to construct a poster
Jung <i>et al.</i> ¹⁵	Included
Price ⁴⁰	Commentary on how to disseminate information at conferences
Marx <i>et al.</i> ⁴¹	Included
Hand ⁴²	Article on how to construct a poster
Rowe & Ilic ³¹	Included
Davis <i>et al.</i> ⁴³	Included
Lieger <i>et al.</i> ¹⁶	Included
Rowe & Ilic ²¹	Article was a commentary on poster presentations
Jahanfar <i>et al.</i> ⁴⁴	Intervention was not a poster presentation
Vessey & DeMarco ⁴⁵	Focus of the paper was not on poster presentations and knowledge transfer
Gilaberte <i>et al.</i> ²⁵	Included
Marx <i>et al.</i> ²⁶	Included
Carpenter <i>et al.</i> ⁴⁶	Focus of the paper was not on poster presentations and knowledge transfer
Cebotarenco & Bush ²⁴	Included
Anonymous ⁴⁷	News report on use of posters in hospitals
Sleister ⁴⁸	Focus of the paper was not on poster presentations and knowledge transfer
Pless <i>et al.</i> ¹⁷	Included
Schmidt & Brown ⁴⁹	Focus of the paper was not on poster presentations and knowledge transfer
McMillan <i>et al.</i> ⁵⁰	Focus of the paper was not on poster presentations and knowledge transfer
Lannon ⁵¹	Focus of the paper was not on poster presentations and knowledge transfer
Levetan <i>et al.</i> ⁵²	Focus of the paper was not on poster presentations and knowledge transfer
Creedon ²³	Included

(continued)

Table 2. (continued)

Study	Reason for inclusion/exclusion
Etter & Laszlo ¹⁸	Included
Bankole <i>et al.</i> ¹⁹	Included
Nishtar <i>et al.</i> ²⁰	Included
Fuchs & Thomas ⁵³	Focus of the paper was not on poster presentations and knowledge transfer
Cowin <i>et al.</i> ⁵⁴	Commentary on the design of a project that includes poster presentations
Quek & Li ⁵⁵	Focus of the paper was not on poster presentations and knowledge transfer
Redlick <i>et al.</i> ⁵⁶	Focus of the paper was not on poster presentations and knowledge transfer
Pizem & Dedobbeleer ⁵⁷	Commentary on the design of a project that includes poster presentations
Davis <i>et al.</i> ⁵⁸	Focus of the paper was not on poster presentations and knowledge transfer
Islam & Hasan ⁵⁹	Included
Merok ⁶⁰	Focus of the paper was not on poster presentations and knowledge transfer
Moule <i>et al.</i> ¹¹	Commentary on how to use posters in the education setting
Anonymous ⁶¹	News report on use of posters by celebrities
Visser <i>et al.</i> ⁶²	Focus of the paper was not on poster presentations and knowledge transfer
Nelson ⁶³	Article examining the imagery of posters
Williams & Ray ⁶⁴	Focus of the paper was not on poster presentations and knowledge transfer
Alcalay <i>et al.</i> ⁶⁵	Commentary on the design of a project that includes poster presentations
Anonymous ⁶⁶	News report
Turnbull <i>et al.</i> ²²	Included
IPPF ⁶⁷	Focus of the paper was not on poster presentations and knowledge transfer

were unanimous in their conclusions that the poster was not effective at facilitating knowledge transfer be it through an increase in knowledge, change in attitude or behaviour.^{15–20} This conclusion was supported by an evaluation study, in which participants identified that posters needed to be accompanied by another source of information to be effective – otherwise the only drawing point to the poster is the imagery.²¹

Studies that incorporated the poster presentation as part of an integrated or multi-modal educational intervention achieved improvements for the most part in knowledge and behaviour.^{22–26} One study did not achieve any improvement in outcomes although this could be attributed to the passive nature of the intervention (i.e. a poster presented with

Table 3 Studies identified and outcomes assessed

Study	Methodology	Outcomes
Williams & Bethea ²⁷	Poster integrated with a leaflet campaign on oral cancer. Survey of patients sitting in the waiting room of dentists.	Approximately 40% of respondents had read the information available on the poster/leaflet. The authors conclude that utilising this approach will have limited effects on knowledge transfer.
Jung <i>et al.</i> ¹⁵	Standalone posters on sun protective behaviour. Survey of patients sitting in the waiting room.	Only half of the participants noticed the posters, with two-thirds of participants drawn to the imagery on the poster. Only 5% of the target population asked the staff for further information on sun protective behaviour based on the poster information.
Rowe & Ilic ³¹	A survey of academics assessing their opinions, experiences and attitudes and experiences of poster presentations.	Majority of participants valued the poster as a form of academic publication. Over 90% believed that imagery of the poster dictated is success in gaining viewers'/readers' attention, with the majority of participants stating that posters needed to be accompanied in order to facilitate knowledge transfer best.
Davis <i>et al.</i> ⁴³	A randomised controlled trial on stroke knowledge in patients receiving either a standard poster, or a modified poster using a health communications model.	No difference in knowledge was observed between the two groups.
Lieger <i>et al.</i> ¹⁶	Standalone poster on management of dental injuries distributed to school teachers. Survey of teachers post-intervention.	Modest improvements were evident in knowledge.
Gilaberte <i>et al.</i> ²⁵	Poster integrated as part of a multi-modal educational campaign on skin cancer in primary school children. The study utilised a before/after methodology.	General knowledge about skin cancer increased, with behaviour (i.e. desire to tan, not wearing sun protection) slightly modified for the positive.
Marx <i>et al.</i> ²⁶	Poster integrated as part of a multi-modal educational campaign on stroke in consumers. The study utilised a before/after methodology.	General knowledge and awareness about stroke increased significantly post-intervention.
Cebotarenco & Bush ²⁴	Poster integrated with other educational tools to reduce use of antibiotics for cold/flu in adults and school children. The study utilised a before/after methodology.	Post-intervention evaluation identified that knowledge on the topic increased, and that behaviour changed – with participants not using antibiotics as their preferred choice for treating colds/flu.
Pless <i>et al.</i> ¹⁷	Standalone posters on injuries were placed in the waiting rooms of general practices as part of a crossover randomised trial with patients.	Only 16% of study participants recalled viewing the posters in the waiting rooms, with no participants citing the poster as their main source of information on the topic. The authors the study concluded that posters in this particular context did not work in modifying behaviour, knowledge or attitudes.
Creedon ²³	Poster integrated with other educational interventions to promote hand washing of health workers. The study utilised a before/after methodology.	A significant improvement in hygiene compliance was observed post-intervention, as well as an increase in knowledge on the topic.
Etter & Laszlo ¹⁸	Standalone posters on smoking cessation placed in billboards. Survey post-campaign with consumers.	Approximately one-third of survey respondents recalled seeing the posters. Authors concluded that the posters had no effect on increasing the rates of smoking cessation.

(continued)

Table 3. (continued)

Study	Methodology	Outcomes
Bankole <i>et al.</i> ¹⁹	Standalone posters in workplace of nurses to change opinion about specific health issues. Survey of nurses after 18 months to assess behaviour change.	Nurse opinion on health issues did not change after 18 months of exposure to the posters in the workplace. The authors concluded that posters would be more effective as an accompaniment to a formal discussion on the topics.
Nishtar <i>et al.</i> ²⁰	Standalone poster in the waiting rooms of health facilities with information on hypertension. Survey of consumers post-health appointment.	Over 80% of patients noticed the poster, with over 90% understanding that the poster was asking them to have their blood pressure checked. However, only approximately half of the patients requested their doctor to check their blood pressure.
Islam & Hasan ⁵⁹	Survey of consumers relating to knowledge on family planning.	Consumers recalled information about family planning conveyed mostly via radio and television – with <10% recalling information presented in poster format.
Turnbull <i>et al.</i> ²²	Poster integrated with other educational interventions to promote greater uptake of breast screening. Survey of women post-educational sessions.	Knowledge about breast cancer risk did not change, but increases were observed in the proportion of women who had heard of mammography and screening for breast cancer.

a leaflet).²⁷ A randomised controlled trial (RCT) evaluated the effectiveness of using a poster in which the content was theory driven, as opposed to a 'pictorial' poster – no difference in knowledge transfer outcomes was noticed between the two models.

Discussion

This state of the art review of the literature identified no studies that evaluated the effectiveness of posters in direct comparison with other educational interventions. Most studies utilised a before/after methodology, with the common conclusion that posters elicit greatest effectiveness in knowledge transfer when integrated with other educational modalities.^{22–26} Posters as a single intervention did not elicit changes in knowledge, attitudes or behaviour.

The lack of empirical data highlights a remarkable information gap about a communication format that is extensively used across a variety of health disciplines to transfer knowledge between researchers, practitioners and end-users. There are numerous published studies on how to 'construct' a poster presentation, yet no studies have evaluated the effectiveness of the poster presentation in actively changing user knowledge, attitudes or behaviour.²⁸ Given that posters have been discussed within associated literature for an excess of

20 years, it is remarkably disappointing that such an established practice within the healthcare disciplines is entirely lacking in its supporting evaluative evidence.

What barriers does the poster medium encounter in the field of knowledge transfer?

A common barrier encountered in knowledge transfer is a lack of user awareness of the evidence.⁴ Posters are designed to give a visual representation of an issue that firstly attracts attention, which may overcome such perceived barriers. Layout, including colour schemes, framing of information and readability all influence how effectively the key information can be conveyed to the reader.^{8,10,12,29} Poster presentations are not well equipped to accommodate alternative learning styles. Whilst an audience may consist of those who best learn when reading information, a poster also needs to provide clear navigation planes in order to provide a sequential logic.^{10,12,29}

Given its passive nature; if not accompanied by an active intervention (e.g. oral presentation, physical interaction), which can help with aural and verbal learning exchange, the 'traditional' poster may only reach a limited proportion of its intended audience.^{30,31} By embedding knowledge in interactions that involve people, it is possible to achieve reciprocal dialogue, which is the most effective

method of transferring tacit knowledge.³² Pursuing a reciprocal dialogue approach facilitates both parties in sharing the socialisation process that involved in achieving mutual understanding and effective knowledge transfer. Integrating computer and information technology with poster presentations still appear to be in its infancy, with limited innovations currently available that promote a learner centred and active method of education.^{30,31}

Poster presentations – where to from here?

Health education has undergone a transformation from the predominant didactic delivery of information to a learner-centred format. This addresses the learner's needs and utilises interactive communication formats to achieve effective knowledge transfer. Poster presentations are accepted as a valid form of transferring academic knowledge,³¹ however, the measured impact of poster presentations on knowledge, attitudes and behaviour remains unknown. In the era of evidence-based practice, researchers and educators should reflect on the merits of using the poster presentation as a tool for knowledge transfer in the absence of any evidence on its effectiveness. Within this, research is required to identify the effectiveness of incorporating aspects of information technology into poster presentations. This may promote an interactive learning environment for users and counter the current passive nature of poster design.³¹

Conclusions

The poster presentation is a commonly used format for communicating information within the academic and public health fields. Whilst the production of a poster may seem relatively simple and inexpensive, the reality is that presenting a poster is quite expensive in terms of the man hours, publishing costs and travel expenses required to present it at various forums. Based on current evidence, users should not use a standalone poster in an attempt to achieve knowledge transfer – rather, an integrated approach with supplemental material is required to achieve changes in user knowledge, attitude and behaviour. Well-designed empirical studies are required to establish an evidence base to inform how posters may best be

developed and implemented in order to achieve successful knowledge transfer.

References

- Lang, E., Wyer, P. & Haynes, B. Knowledge translation: closing the evidence-to-practice gap. *Annals of Emergency Medicine* 2007, **49**, 355–363.
- Canadian Institutes of Health Research. About knowledge translation. Available at: <http://www.cihr-irsc.gc.ca/e/29418.html> (accessed 22 September 2012).
- Davis, D., Evans, M., Jadad, A., Perrier, L., Rath, D., Ryan, D., Sibbald, G., Straus, S., Rappolt, S., Wowk, M. & Zwarenstein, M. The case for knowledge translation: shortening the journey from evidence to effect. *BMJ* 2003, **237**, 33–35.
- Glasziou, P. & Haynes, B. The paths from research to improved health outcome. *Evidence-Based Nursing* 2005, **8**, 36–38.
- Grimshaw, J. & Eccles, M. Is evidence-based implementation of evidence-based care possible? *Medical Journal of Australia* 2004, **1810**, S50–S51.
- Davis, D., O'Brien, M., Freemantel, N., Wolf, F., Mazmanian, P. & Taylor-Vaisey, A. Impact of formal continuing medical education: do conferences, workshops, rounds, and other traditional continuing education activities change physician behavior or health care outcomes? *The Journal of the American Medical Association* 1999, **282**, 867–874.
- Randolph, W. & Viswanath, K. Lessons learned from public health mass media campaigns: marketing health in a crowded media world. *Annual Review of Public Health* 2004, **25**, 419–437.
- Berg, J. Creating a professional poster presentation: focus on nurse practitioners. *Journal of the American Academy of Nurse Practitioners* 2005, **17**, 245–248.
- Duchin, S. & Sherwood, G. Posters as an educational strategy. *The Journal of Continuing Education in Nursing* 1990, **21**, 205–208.
- Keely, B. Planning and creating effective scientific posters. *The Journal of Continuing Education in Nursing* 2004, **35**, 182.
- Moule, P., Judd, M. & Giroit, E. The poster presentation: what value to the teaching and assessment of research in pre and post-registration nursing courses? *Nurse Education Today* 1998, **18**, 237–242.
- Taggart, H. & Arslanian, C. Creating an effective poster presentation. *Orthopedic Nursing* 2000, **19**, 47–52.
- Erren, T. & Bourne, P. Ten simple rules for a good poster presentation. *PLoS Computational Biology* 2007, **3**, 777–778.
- Grant, M. & Booth, A. A typology of reviews: an analysis of 14 review types and associated methodologies. *Health Information and Libraries Journal* 2009, **26**, 91–108.
- Jung, G. W., Senthilselvan, A. & Salopek, T. G. Ineffectiveness of sun awareness posters in dermatology clinics. *Journal of the European Academy of Dermatology & Venereology* 2010, **24**, 697–703.

- 16 Lieger, O., Graf, C., El-Maaytah, M. & Von Arx, T. Impact of educational posters on the lay knowledge of school teachers regarding emergency management of dental injuries. *Dental Traumatology* 2009, **25**, 406–412.
- 17 Pless, I. B., Hagel, B., Patel, H., Leduc, D. & Magdalinis, H. Preventing product-related injuries: a randomized controlled trial of poster alerts. *Canadian Journal of Public Health. Revue Canadienne de Sante Publique* 2007, **98**, 271–275.
- 18 Etter, J.-F. & Laszlo, E. Evaluation of a poster campaign against passive smoking for World No-Tobacco Day. *Patient Education & Counseling* 2005, **57**, 190–198.
- 19 Bankole, O. O., Aderinokun, G. A. & Denloye, O. O. Evaluation of a photo-poster on nurses' perceptions of teething problems in South-western Nigeria. *Public Health* 2005, **119**, 276–282.
- 20 Nishta, r. S., Zoka, N., Nishtar, S. S., Khan, S. Y., Jehan, S. & Mirza, Y. A. Posters as a tool for disseminating health related information in a developing country: a pilot experience. *JPMMA – Journal of the Pakistan Medical Association* 2004, **54**, 456–460.
- 21 Rowe, N. & Ilic, D. Innovating professional knowledge transfer: from academic poster to 'MediaPoster'. *Medical Education* 2009, **43**, 496.
- 22 Turnbull, D., Adelson, P. & Irwig, L. Evaluating the impact of a promotional campaign for screening mammography: women's knowledge and sources of awareness. *Australian Journal of Public Health* 1992, **16**, 72–78.
- 23 Creedon, S. A. Healthcare workers' hand decontamination practices: compliance with recommended guidelines. *Journal of Advanced Nursing* 2005, **51**, 208–216.
- 24 Cebotarencu, N. & Bush, P. J. Reducing antibiotics for colds and flu: a student-taught program. *Health Education Research* 2008, **23**, 146–157.
- 25 Gilaberte, Y., Alonso, J. P., Teruel, M. P., Granizo, C. & Gallego, J. Evaluation of a health promotion intervention for skin cancer prevention in Spain: the SolSano program. *Health Promotion International* 2008, **23**, 209–219.
- 26 Marx, J. J., Nedelmann, M., Haertle, B., Dieterich, M. & Eicke, B. M. An educational multimedia campaign has differential effects on public stroke knowledge and care-seeking behavior. *Journal of Neurology* 2008, **255**, 378–384.
- 27 Williams, M. & Bethea, J. Patient awareness of oral cancer health advice in a dental access centre: a mixed methods study. *British Dental Journal* 2011, **210**, E9.
- 28 Rowe, N. & Ilic, D. Poster presentation – a visual medium for academic and scientific meetings. *Paediatric Respiratory Reviews* 2011, **12**, 208–213.
- 29 Butz, A., Kohr, L. & Jones, D. Developing a successful poster presentation. *Journal of Pediatric Health Care* 2004, **46**, 45–48.
- 30 De Simone, R., Rodrian, J., Osswald, B., Sack, F., De Simone, E. & Hagl, S. Initial experience with a new communication tool: the 'Digital Interactive Poster Presentation'. *European Journal of Cardio-thoracic Surgery* 2001, **19**, 953–955.
- 31 Rowe, N. & Ilic, D. What impact do posters have on academic knowledge transfer? A pilot survey on author attitudes and experiences. *BMC Medical Education* 2009, **9**, 71.
- 32 Argote, L. & Ingram, P. Knowledge transfer: a basis for competitive advantage in firms. *Organizational Behaviour and Human Decision Processes* 2000, **82**, 150–169.
- 33 Hertrampf, K., Wenz, H. J., Koller, M., Grund, S. & Wiltfang, J. The oral cancer knowledge of dentists in Northern Germany after educational intervention. *European Journal of Cancer Prevention* 2011, **20**, 431–437.
- 34 Kao, D. J., Hudmon, K. S. & Corelli, R. L. Evaluation of a required senior research project in a doctor of pharmacy curriculum. *American Journal of Pharmaceutical Education* 2011, **75**, 5.
- 35 Kelsch, M. P. & Werremeyer, A. B. Poster project to emphasize public health in the pharmacy curriculum. *American Journal of Pharmaceutical Education* 2011, **75**, 2.
- 36 Klimes-Dougan, B. & Lee, C.-Y. S. Suicide prevention public service announcements: perceptions of young adults. *Crisis* 2010, **31**, 247–254.
- 37 McDonnell, T. E. Cultural objects as objects: materiality, urban space, and the interpretation of AIDS campaigns in Accra, Ghana. *AJS – American Journal of Sociology* 2010, **115**, 1800–1852.
- 38 Kearns, T. M., Schultz, R., McDonald, V. & Andrews, R. M. Prophylactic penicillin by the full moon: a novel approach in Central Australia that may help to reduce the risk of rheumatic heart disease. *Rural and Remote Health* 2010, **10**, 1464.
- 39 Goldman, K. D. & Schmalz, K. J. Poster session fundamentals: becoming a proficient "poster child" for health education. *Health Promotion Practice* 2010, **11**, 445–449.
- 40 Price, B. Disseminating best practice at conferences. *Nursing Standard* 2010, **24**, 35–41.
- 41 Marx, J. J., Klawitter, B., Faldum, A., Eicke, B. M., Haertle, B., Dieterich, M. & Nedelmann, M. Gender-specific differences in stroke knowledge, stroke risk perception and the effects of an educational multimedia campaign. *Journal of Neurology* 2010, **257**, 367–374.
- 42 Hand, H. Reflections on preparing a poster for an RCN conference. *Nurse Researcher* 2010, **17**, 52–59.
- 43 Davis, S. M., Martinelli, D., Braxton, B., Kutrovac, K. & Crocco, T. The impact of the extended parallel process model on stroke awareness: pilot results from a novel study. *Stroke* 2009, **40**, 3857–3863.
- 44 Jahanfar, S., Lye, M. S. & Rampal, L. A randomised controlled trial of peer-adult-led intervention on improvement of knowledge, attitudes and behaviour of university students regarding HIV/AIDS in Malaysia. *Singapore Medical Journal* 2009, **50**, 173–180.
- 45 Vessey, J. A. & DeMarco, R. F. The undergraduate research fellows program: a unique model to promote engagement in research. *Journal of Professional Nursing* 2008, **24**, 358–363.
- 46 Carpenter, R., Fishlock, A., Mulroy, A., Oxley, B., Russell, K., Salter, C., Williams, N. & Heffernan, C. After 'Unit 1421': an exploratory study into female students' attitudes and behaviours towards binge drinking at Leeds University. *Journal of Public Health* 2008, **30**, 8–13.

- 47 Critical path network. Poster alerts patients to their discharge responsibilities. *Hospital Case Management* 2007; **15**, 151–153.
- 48 Sleister, H. M. Isolation and characterization of Saccharomyces cerevisiae mutants defective in chromosome transmission in an undergraduate genetics research course. *Genetics* 2007, **177**, 677–688.
- 49 Schmidt, N. A. & Brown, J. M. Use of the innovation-decision process teaching strategy to promote evidence-based practice. *Journal of Professional Nursing* 2007, **23**, 150–156.
- 50 McMillan, D. E., Bell, S., Benson, E. E., Mandzuk, L. L., Matias, D. M., McIvor, M. J., Robertson, J. E. & Wilkins, K. L. From anxiety to enthusiasm: facilitating graduate nursing students' knowledge development in science and theory. *Journal of Nursing Education* 2007, **46**, 88–91.
- 51 Lannon, S. L. Leadership skills beyond the bedside: professional development classes for the staff nurse. *Journal of Continuing Education in Nursing* 2007, **38**, 17–21.
- 52 Levetan, C. S., Dawn, K. R., Murray, J. F., Popma, J. J., Ratner, R. E. & Robbins, D. C. Impact of computer-generated personalized goals on cholesterol lowering. *Value in Health* 2005, **8**, 639–646.
- 53 Fuchs, S. & Thomas, N. The European Basic Core Curriculum for Nephrology Nursing, the process of writing, publishing and disseminating. *Edtna-Erca Journal* 2003, **29**, 178–180.
- 54 Cowin, L., Davies, R., Estall, G., Berlin, T., Fitzgerald, M. & Hoot, S. De-escalating aggression and violence in the mental health setting. *International Journal of Mental Health Nursing* 2003, **12**, 64–73.
- 55 Quek, J. T. & Li, S. C. A study of the effectiveness of AIDS health education interventions among the adolescent population of Singapore. *Singapore Medical Journal* 2002, **43**, 359–364.
- 56 Redlick, F., Cooke, A., Gomez, M., Banfield, J., Cartotto, R. C. & Fish, J. S. A survey of risk factors for burns in the elderly and prevention strategies. *Journal of Burn Care & Rehabilitation* 2002, **23**, 351–356.
- 57 Pizem, P. & Dedobbeleer, N. [Preliminary validation of a poster on oral hygiene in the elderly]. *Sante Publique (Vandoeuvre-Les-Nancy)* 2001, **13**, 277–285.
- 58 Davis, T. C., Fredrickson, D. D., Arnold, C. L., Cross, J. T., Humiston, S. G., Green, K. W. & Bocchini, J. A. Jr. Childhood vaccine risk/benefit communication in private practice office settings: a national survey. *Pediatrics* 2001, **107**, E17.
- 59 Islam, M. M. & Hasan, A. H. Mass media exposure and its impact on family planning in Bangladesh. *Journal of Biosocial Science* 2000, **32**, 513–526.
- 60 Merok, E. [What I can do and know as a physician. A poster for inspiration and protection]. *Tidsskrift for Den Norske Laegeforening* 1998, **118**, 4407–4408.
- 61 Successful approaches. Sports stars and HEAPS. *Pacific AIDS Alert Bulletin* 1996, **12**, 11.
- 62 Visser, A., Alkema, I. & van Koppen, K. Public cancer information by GPs: evaluation of a Dutch campaign. *Patient Education & Counseling* 1994, **24**, 117–125.
- 63 Nelson, S. D. Wear your hat: representational resistance in safer sex discourse. *Journal of Homosexuality* 1994, **27**, 285–304.
- 64 Williams, G. & Ray, S. AIDS and the workplace: signs of hope from Zimbabwe. *Global Aids news: the Newsletter of the World Health Organization Global Programme on AIDS* 1994, **1**, 3–6.
- 65 Alcalay, R., Ghee, A. & Scrimshaw, S. Designing prenatal care messages for low-income Mexican women. *Public Health Reports* 1993, **108**, 354–362.
- 66 November campaign to increase pill awareness. *Family Planning Today* 1993, **1**.
- 67 International Planned Parenthood Federation IAPU, League of Red C & Red Crescent S. A unique collaboration in Chile. *AIDS Watch* 1989, **8**, 8.

Received 8 May 2012; Accepted 15 November 2012