

**UNIVERSITY OF WESTERN SYDNEY**  
School of Exercise and Health Sciences



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**Increasing the use of  
research evidence  
by occupational therapists**

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**Final Report**

by  
**Annie McCluskey**  
May 2004

**A project funded by the Motor Accidents  
Authority of NSW**



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*Annie McCluskey*

May 2004

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# EXECUTIVE SUMMARY

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This mixed methods study involved a group of occupational therapists in New South Wales, Australia. The study was planned in 2001, implemented in 2002 and 2003. The study was based on the best available evidence on teaching and implementing evidence-based practice, and effecting change in practitioner behaviour.

## Aims of the Study

The primary aims of the study were to:

- **Teach** a group of 114 therapists how to search for, appraise and apply research evidence
- **Measure** changes in perceived barriers, skills, knowledge, attitudes and activity levels over a period of 8 months
- **Explore** the change process, and each participant's experience of becoming an evidence-based practitioner and managing barriers to EBP
- **Disseminate** evidence summaries completed by participants (known as critically appraised topics or 'CATs')

## Study Methods

The first phase involved a 'before and after' study design. There was no control group or random allocation. An educational intervention was provided in February 2002 in the form of a 2-day workshop on evidence-based practice (EBP). A secondary intervention, outreach support was also provided to all participants for 8 months. Outreach support was provided by email, telephone and an optional workplace visit. Outreach support was intended to provide encouragement, practical assistance and help promote change. A number of measures were used to evaluate change over time. These measures are described below.

In the second phase, qualitative data were collected and analysed using grounded theory methods. Semi-structured interviews were conducted in mid 2003 with 10 participants. This phase of the study explored the process of change and each participant's experience of becoming an evidence-based practitioner.

## Outcome Measures

Quantitative data were collected on each participant's knowledge, skills, attitudes, and about perceived barriers to adopting evidence-based practice. This information was collected using a survey questionnaire, administered on three occasions during 2002 (before and after the workshop and at follow-up). The survey was comprised of existing survey instruments, and included an adapted version of the Fresno Test of EBM<sup>1</sup>.

Participants also submitted diaries of their activity levels before and after the workshop (i.e. they documented engagement in search and appraisal activities and reading published research). These data were analysed quantitatively and indicate each

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<sup>1</sup> Ramos, K. D., Schafer, S., & Tracz, S. M. (2003). Validation of the Fresno test of competence in evidence based medicine. *British Medical Journal*, 326, 319-321.

participant's activity levels and the proportion who engaged in each of the nominated activities.

## RESULTS

At the 8-month follow-up period, 88 participants (77%) were still involved in the study. There were 26 dropouts (23%) over the year. Participants dropped out primarily because of personal circumstances. Some felt overcommitted. Others felt they had insufficient time to complete the project assignment. Many participants remained in the study and completed the third survey but did not complete the project assignment (a critically appraised topic or CAT).

### Perceived Barriers

***Lack of time*** and a large workload/caseload were the most commonly reported barriers to becoming an evidence-based practitioner at all three data collection points. This finding is consistent with previous studies. Immediately after the workshop, a higher percentage of participants (94%) reported lack of time as a barrier than had done so before (75%). This increase was because of the realisation that many hours would be required to conduct searches, read and appraise literature in order to complete a summary of evidence for the project.

***Lack of access to the internet at work*** was a problem for over one quarter of participants initially (28%), although many had a desktop computer. This statistic changed little over time, with 23% continuing to experience the same problem 8-months later. This perceived barrier to EBP was reported by metropolitan and rural participants, as well as those employed in hospitals and community settings. However, lack of internet access was reported rarely by privately-employed participants who typically worked from home and had private internet access.

These figures do not necessarily indicate that 23% of participants were unable to access electronic databases. For example, NSW Health employees have access to a wide range of medical databases through the Clinical Access Information Program (CIAP), to the OTseeker<sup>2</sup> and the PEDro<sup>3</sup> evidence databases, although they cannot access the internet generally. Furthermore, nearly one quarter of participants engaged in search and appraisal activities outside of work hours (usually at home) because of lack of time during work hours.

Over time, fewer participants reported the following issues to be a barrier to EBP: professional isolation, limited searching skills, limited critical appraisal skills, use of research evidence not being a priority, lack of evidence to support occupational therapy practice, and the large volume of published research. Private practitioners found ways to obtain journal articles, usually by working with a 'buddy'. Others improved their skills through practice and by teaching others how to search for and appraise research.

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<sup>2</sup> **OTseeker** = 'Occupational Therapy Evaluation of Evidence', a specialised freely available evidence database at [www.otseeker.com](http://www.otseeker.com)

<sup>3</sup> **PEDro** = Physiotherapy Evidence Database, a specialised freely available evidence database available at [www.pedro.fhs.usyd.edu.au](http://www.pedro.fhs.usyd.edu.au)

## Attitudes to EBP

Immediately after the workshop, there was an 11% increase in the number of participants who felt that EBP could be managed in conjunction with their usual work responsibilities. There was also a 31% increase in the number who felt they could engage in EBP because there was a respectable body of occupational therapy research to draw on. The workshop had taught them how to use databases of pre-appraised evidence, and drew their attention to the body of occupational therapy research evidence available through the OTseeker evidence database. At follow-up, 8 months later, there were no significant changes in attitude, as measured by the survey instrument.

## Skills and Knowledge

*Self-reports:* There was an immediate increase in the proportion of therapists who felt their skills and knowledge had improved after the 2-day workshop. More participants were aware of, and had used a range of electronic databases than before (45% before; 93% after). A greater proportion felt confident generating a focussed clinical question (33% before; 82% after) and more participants felt able to conduct a computer search on their own (43% before; 85% after).

Critical appraisal skills were a greater challenge, with only one quarter of participants reporting that they felt confident with their appraisal skills after the workshop (18% before; 24% after). Participants recognised that being able to confidently appraise and interpret research findings involved time and commitment. At follow-up 8 months later, 36% of participants felt confident that they could appraise a research paper, suggesting that over time and with practice their skills had continued to improve.

*Knowledge Test Questions:* After the workshop, knowledge levels increased substantially for seven out of the eight test questions. Increases were reported for the following questions:

- 52% increase in correct response to Q.1: ‘A good clinical question consists of the PICO<sup>4</sup> format’ (Answer: YES);
- 73% increase in correct response to Q.3: ‘An electronic database such as PubMed can only be accessed from hospital/ university libraries’ (Answer: NO);
- 53% increase in correct response Q.4: ‘The Cochrane database is good to look for high quality evidence’ (Answer: YES);
- 69% increase in correct response to Q.5: ‘Confidence intervals are a measure of clinical significance’ (Answer: YES);
- 17% increase in correct response to Q.6: ‘The P value is a measure of reliability’ (Answer: NO);
- 31% increase in correct response to Q.7: ‘Single case designs are regarded as a similar level of evidence to an RCT’ (Answer: NO) and
- 59% increase in correct response to Q.8: ‘There is a recognised hierarchy of evidence for qualitative research’ (Answer: NO).

At follow-up, the primary difference was that more participants correctly *disagreed* with the statement ‘Databases such as Medline/Pubmed contain only high quality evidence’ (up by 30% compared to post-workshop). Over time and with practice, they learned that the quality of articles contained on PubMed and Medline can be highly variable, requiring use of critical appraisal skills to screen abstracts.

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<sup>4</sup> PICO = P for population; I for intervention; C for comparison intervention; and O for outcome



*The Adapted Fresno Test (AFT) of EBP (knowledge test):* The mean AFT score for the sample was 57/153 (range 0 to 123) pre-workshop, with the majority unable to reach the 50% 'pass mark' of 76.5. This result was anticipated because most of the participants were novices at EBP. However, the mean AFT score post-workshop was 78/153 (range 29 to 121), and at follow-up 80/153 (range 36 to 152). These scores indicate a substantial increase in knowledge as a result of the 2-day workshop. These gains in knowledge were maintained at follow-up 8 months later.

## **Activity Levels**

Participants kept a prospective work diary of their pre- and post-workshop activities, including searching, reading, appraising and teaching others about EBP. These diaries were collected every two months.

Although there was a modest increase in activity levels immediately after the workshop, there was a steady decline in the proportion of participants engaging in each activity thereafter. A key finding was that activity levels were low initially and remained low, even with the additional outreach support. Only a small number of participants used the skills and knowledge learned at the workshop. This finding confirms what is already known: that using new skills and knowledge upon return to work, and implementing EBP remains a major challenge for health professionals.

Almost two thirds of participants did not read any research literature, and even less engaged in critical appraisal. The majority read no research articles over 8 weeks. This was a surprising finding. The implication is that between two thirds and three quarters of occupational therapists in this study were not keeping up-to-date, if one research article over 8 weeks (six research articles over a year) is accepted as a minimum requirement.

Finally, although half of the activities were conducted during work hours, one quarter were conducted before or after work. Participants acknowledged that keeping up to date and engaging in EBP required them to spend time outside work engaged in these activities.

## **Critically Appraised Topics (CATs)**

By February 2003, 12 months post intervention, a total of 23 participants had completed 15 critically appraised topics. Most topics were completed by pairs of participants, and are freely available at [www.otcats.com](http://www.otcats.com) in PDF format. The website was developed as part of the project and launched on the 1 May 2003. The site receives over 600 visitors each month (over 5,000 in 12 months). New CATs have also been completed by therapists from interstate, from the USA, and by 4th year undergraduate students at the University of Western Sydney. One of the CATs has recently been revised and updated by two of the more active study participants.

## The Process of Becoming an Evidence-Based Practitioner

Ten participants were interviewed about the change process. Those who had been most active during the previous 18 months talked about strategies they had used to engage with EBP. They talked about managing and overcoming barriers, particularly the lack of time for EBP, how they developed their skills and knowledge, and remained focussed and motivated.

The pro-active participants were labelled '*Competent Non-Experts*' because although they had developed higher level skills for searching and critical appraisal, they were not yet experts. They were optimistic about, and could imagine a future involving EBP. They were the opinion leaders and 'champions' of EBP, and ran education sessions at the workplace for colleagues. Several had revised the policies and procedures of their organisation to incorporate and value EBP. However, no-one in the study had changed their clinical practice in response to best evidence.

Conversely, the '*Novices*' could not find time for EBP, and were pessimistic about a future involving EBP. They prioritised clinical work ahead of searching for, reading and appraising research. Unlike their more advanced colleagues, *Novices* were unable to stay focussed on completing their critical appraisal, and developing their skills and knowledge. They persistently talked about lack of time as a barrier to EBP, whereas the *Competent Non-Experts* spoke little about lack of time, and had moved beyond the barriers.

Four conditions or factors appeared to help participants to become more evidence-based and move beyond the perceived barriers. These conditions were: (i) **readiness for change**, both in terms of being time-ready, intellectually ready, resource ready and skill ready; (ii) **personal and organisational expectations** that they would apply and share the knowledge they had acquired; (iii) the **presence of deadlines**, both intrinsic and extrinsic which drove the pro-active participants to stay focussed and motivated, provided direction and focus; and (iv) the **availability of support**, including financial assistance, work concessions, internet access and a computer, as well as encouragement and help from managers, the organisation, buddies and peers.

In summary, becoming an evidence-based practitioner involved three key strategies: Finding time for EBP, developing skills and knowledge, and staying focussed. Conditions such as being ready to change, expecting that knowledge would be applied and used in the workplace, feeling and being supported, and responding to deadlines assisted this process.

## Implications and Recommendations

### *Delivery and Format of EBP Education:*

The workshop was delivered over 2-days, partly to accommodate country therapists. A split format, spread over several weeks was not considered feasible because of distances and the potential for dropouts if the demands on participants' were increased. A series of shorter 3-hour modules has since been trialled by OT-Australia NSW during 2003 and 2004, at different times of the day, across different days of the week and at a variety of venues in Sydney. Unfortunately, these modules have attracted only five or six participants to each session.

**Recommendation 1:** That a 2-day workshop format be used for delivery of education on EBP in Australia (or for research purposes) given the distances participants need to travel.

**Recommendation 2:** Alternatively, distance learning packages involving the internet and email communication might be developed, pilot-tested and evaluated to teach therapists about aspects of EBP and support them during the change process.

### *Outreach Support*

In addition to education, this study provided outreach support for an extended period of time. The aim was to help therapists apply their new skills and knowledge, and change their behaviour. However, a limitation of the study was that after Survey 2 had been completed (immediately post-workshop), it was not possible to separate the effect of outreach support on behaviour from the effect of the 2-day workshop. Thus the findings should be considered exploratory.

Interview data and feedback more generally revealed that the visit acted as a 'booster' session for a number of participants, two to three months after the workshop. For others, the outreach visit acted as a catalyst, helping them to re-engage with EBP. However, not all participants needed or wanted an outreach support visit. Some had already found their own supports and mentors, who would exist beyond the life of the project.

Outreach visits were expensive in terms of time, travel and accommodation costs. In reality much of the support was provided by telephone, before and after visits, or in lieu of a visit. Many guided searches were conducted by telephone.

**Recommendation 3:** That future studies and projects provide support by telephone and email, by videoconference or teleconference. These modes of communication are more practical and less costly than workplace visits, particularly with the large distances in Australia.

### *Measuring Change: Skills and Knowledge required for EBP*

Anecdotally, few health professionals who teach EBP appear to be using outcome measures routinely as part of their teaching practice. In this study, survey questions that required an 'agree/ disagree' response were easily categorised for analysis. This type of question is recommended for measuring changes in EBP knowledge levels following undergraduate and graduate education programs.

The Adapted Fresno Test of EBP was used in this study, was found to be a reliable instrument which was sensitive to change, and had no ceiling or floor effect. The test takes between 20 and 30 minutes to score. For this reason, the test will primarily be of interest to researchers. Once published, the test is recommended for use by occupational therapy educators and researchers who are interested in evaluating the effectiveness of their intervention. The test could be easily adapted for use by other allied health professions.

**Recommendation 4:** That educators use a range of questions with 'agree/disagree' responses to evaluate the effect of EBP education on knowledge levels, following a workshop or subject at university. Responses with dichotomous responses can be easily categorised and analysed, and used as a routine outcome measure by educators.

**Recommendation 5:** That the Adapted Fresno Test of EBP, once published in a peer reviewed journal, be used by occupational therapy educators and researchers, to measure changes in applied skills and knowledge.

**Recommendation 6:** That the Adapted Fresno Test of EBP be further developed for use with other allied health professions. The primary change required will be the development and testing of new clinical scenarios.

### *Measuring Activity Levels and Engagement with EBP*

The present study collected data on how often participants used the skills and knowledge required for EBP, such as searching, reading, and critically appraising research. Participants obliged by returning their prospective activity records/ daily diaries on a 2 monthly cycle for 8 months following the workshop. This method of data collection succeeded partly because it was consistent with the Accredited Occupational Therapist data collection methods recommended by OT-Australia.

The level of activity was relatively low, and became progressively lower as the year progressed. Nearly two thirds to three quarters of participants reported reading no research literature or articles over 8-weeks. Less than 20% were reading one article over 8 weeks (equivalent to six articles per year) and fewer still engaged in critical appraisal. More participants engaged in searching, although this decreased in frequency over time.

**Recommendation 7:** That organisations and professionals wishing to become more ‘evidence-based’ initiate a journal club<sup>5</sup> that involves: (a) critical appraisal once a month of the ‘best evidence’, on a topic of relevance; (b) use of a recognised critical appraisal checklist or guideline (eg McMaster<sup>6</sup> or CASP<sup>7</sup>); and (c) requires all attendees to read, appraise and discuss the study in question. Such a strategy will encourage staff to read and appraise at least one research-based article each month (up to 10 or 12 per year).

**Recommendation 8:** That the number of journal articles appraised per year be considered a performance indicator for health professionals and organisations.

**Recommendation 9:** That future research projects focusing on the activity levels of professionals collect data (a) prospectively (in order to increase accuracy) and (b) across four key areas of interest: database searching; reading research or EBP-related literature; critical appraisal; and teaching others about EBP.

### *Using Evidence in Practice*

The current study aimed to teach occupational therapists about EBP, and improve their skills and knowledge. While it was hoped that some participants might change their clinical practice in response to research evidence, this goal was beyond the scope of the project. Interviews with 10 of the more proactive participants, 18 months post-workshop revealed that even they had not changed their treatment of individual patients in any significant way. The implementation of evidence in practice is the next stage, and may realistically take some therapists and organisations several years to achieve. The need to change practice will, however, depend on the nature and strength of the evidence reviewed.

**Recommendation 10:** That future studies examine the process of applying evidence in practice by occupational therapists. This aim may be achieved using several methods such as: studying organisational policies, procedures and local practice guidelines for best evidence; analysing business plans to identify a change in attitude, values and intention to become more ‘evidence-based’; auditing practitioners’ practice and clinical notes to determine how often evidence-based treatments are being used with individual clients.

<sup>5</sup> For an example, see Dingle, J., & Hooper, L. (2000). Establishing a journal club in an occupational therapy service: One service's experience. *British Journal of Occupational Therapy*, 63, 554-556.

<sup>6</sup> **McMaster University Occupational Therapy Evidence-Based Practice Research Group**, critical appraisal review forms and guidelines for qualitative and quantitative research studies, Law et al., 1998. Available free as PDF documents at [www-fhs.mcmaster.ca/rehab/ebp/](http://www-fhs.mcmaster.ca/rehab/ebp/)

<sup>7</sup> **Critical Appraisal Skills Programme (CASP)** of the NHS (UK). Appraisal guidelines available free for study designs such as systematic reviews, RCTs, qualitative research, cohort studies. Available as PDF documents (under ‘*Learning Resources*’ at [www.phru.nhs.uk/casp/resourcescasp.htm](http://www.phru.nhs.uk/casp/resourcescasp.htm))

### *Critically Appraised Topics (CATs)*

A tangible outcome of this study was the production of critically appraised topics (CATs) or summaries of evidence, by individuals and pairs of participants. All 114 participants were invited to complete a CAT as their 'assignment' to help apply and advance their skills. A total of 15 CATs were produced by 23 participants at the close of the study. These CATs have since been added to a new website: [www.otcats.com](http://www.otcats.com). The site receives over 600 visits each month (over 5,000 since May 2003). Many visitors to the site download one or more of the completed CATs, free of charge. The CAT assignment helped to focus participants, and resulted in a tangible outcome. The format developed for the study is being used by occupational therapy departments and some universities across Australia, with new CATs being added to the site at regular intervals.

Currently, many diagnostic categories and interventions that constitute occupational therapy practice are not represented on the [www.otcats.com](http://www.otcats.com) website. Diagnostic categories that are not currently represented, but for which a substantial body of research exists<sup>8</sup> include: paediatric, adolescent and adult mental health, intellectual disability, multiple sclerosis, aged care (falls and fractures, dementia), hand injuries, cerebral palsy, learning disabilities, rheumatology, cardiac conditions, oncology and palliative care.

Interventions that are commonly recommended or used by occupational therapists, but are not yet represented on the [www.otcats.com](http://www.otcats.com) website include: hand splinting, living skills training, carer education, home visiting, environmental modifications, driving training, relaxation therapy and stress management, sensory integration, handwriting training, energy conservation, wheelchair education and design.

**Recommendation 11:** That anyone planning to write a CAT as part of a journal club activity or university assignment focus on clinical areas, diagnostic categories and interventions where there are gaps.

**Recommendation 12:** That professionals and departments aim to write up one critically appraised topic (CAT) per year as a result of their journal club for addition to the [www.otcats.com](http://www.otcats.com) website. Existing CATs on the site can be used as a model or template.

**Recommendation 13:** That lecturers who teach EBP and research skills to occupational therapy students at university use CATs as an assignment for senior and postgraduate students. This assignment will assess competency in search and appraisal skills, in addition to lifting the skill and knowledge level of academics.

**Recommendation 14:** That CATs completed by occupational therapy students (internationally) and awarded a High Distinction or Distinction grade be forwarded to the [www.otcats.com](http://www.otcats.com) website for dissemination to the profession.

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<sup>8</sup> Much of this research evidence is already catalogued on the OTseeker website

### *Internet access at work*

Access to the internet at work should be considered a necessity by health professionals and employers. A desktop computer and access to the internet are now 'tools of the trade'. Approximately one quarter of participants in this study did not have access to the internet at work. NSW Health employees could access electronic databases at work, and more recently, the OTseeker and PEDro databases, but did not have wider internet access. Some participants still did not have ready access to the internet or databases at work by the end of the study.

**Recommendation 15:** That occupational therapists and other health professionals who do not have easy access to the internet at work negotiate with their employer for this basic entitlement, using the results of this report to support their submission if necessary.

**Recommendation 16:** That managers and supervisors recognise their responsibility to provide a work environment that encourages and supports EBP. Employee access to the internet and/or to electronic databases at work are essential for organisations that claim to be 'evidence-based'.

### *Time Management and EBP*

Consistent with previous literature, lack of time was the most frequently documented barrier to EBP. Participants' ability (and willingness) to overcome this barrier was critical to their engagement with EBP, and required a change in attitude to work priorities. The attitude that searching for, reading and appraising research was less important than seeing patients and was not 'real work' need to change. Only when this change was made did participants start to integrate these activities into their working day, rather than trying to fit them in at the end of the day or week, or outside of work hours.

The perception that there was too little time for EBP was considerably more challenging to overcome than a lack of skills and knowledge. Participants who were able to engage with EBP more actively recognised the need to spend dedicated time applying their new skills, and that a change in priorities would be needed on a long-term basis. Interview data illustrated that the proactive participants consistently found time for EBP and time to develop their skills and knowledge. They planned ahead, blocked out time in their diaries and prioritised EBP. Conversely, those participants who made less progress over the 18-month period, up to the time of the interviews, tended to procrastinate and delay working on their CAT and focussed much more on barriers and problems instead of getting on with tasks.

**Recommendation 17:** That time management be included as a topic for study and discussion in university and postgraduate curricula, in addition to change management. Quotes from this study can be used to illustrate how busy therapists have successfully incorporated EBP-related activities into their schedule.

**Recommendation 18** : That a journal article on time management, research utilisation and EBP be submitted for publication based on the findings of this study.

**Recommendation 19**: That time management and the uptake of EBP be further explored, given the preliminary nature of this study. Future research might again use quantitative measures (such as time use) combined with interview data to further explore these issues.

#### *Factors that contributed to the uptake of EBP*

Four conditions or factors appeared to help participants become more evidence-based and move beyond the barriers. These conditions were: (i) **readiness for change**, both in terms of being time-ready, intellectually ready, resource ready and skill ready; (ii) **personal and organisational expectations** that they would apply and share the knowledge they had acquired; (iii) the **presence of deadlines**, both intrinsic and extrinsic which drove the pro-active participants to stay focussed and motivated, provided direction and focus; and (iv) the **availability of support**, including financial assistance, work concessions, internet access and a computer, as well as encouragement and help from managers, the organisation, buddies and peers.

**Recommendation 20**: That conditions which helped participants to change and apply their new skills and knowledge be promoted at workshops on EBP to interested practitioners, managers and others (readiness for change, the presence of deadlines, personal and organisational expectations, and support). Furthermore, that these conditions be tested and measured in future research.

**Recommendation 21**: That professionals who attend workshops on EBP are encouraged by their peers and managers to transfer this new knowledge to others through teaching. While this expectation is present in some organisations, only three of the 10 participants interviewed had presented an in-service at work to their colleagues.

**Recommendation 22**: That managers revise their organisation's business plan, orientation procedures, position descriptions and annual reports to reflect their support for EBP. A necessary first step is to articulate an acceptance of, and support for using evidence in practice, and the work done by EBP champions. EBP needs to be visible in documentation before progress will be made towards implementation.

#### *The Process of Change and EBP*

The Trans-Theoretical Change model developed by Prochaska and DiClemente has traditionally been used in the EBP literature to describe the progression of a learner through distinct stages. The current study identified some limitations with this model when applied to EBP, particularly the need for intermediate stages and additional descriptors for each stage.

Analysis of interview data resulted in a provisional theory of change, characterising *novice* users of research, through to *competent non-experts*, who were more



experienced and confident users of research. No ‘experts’ were identified, only those who had advanced skills and knowledge, positive attitudes to EBP, and who engaged frequently in searching, reading and appraisal. However, even 18 months post-workshop, few if any of the participants were implementing evidence, or had changed their practice habits.

**Recommendation 23:** That EBP educators adapt and further test the Prochaska and DiClemente model of change, perhaps adding some intermediate stages and descriptors. This stage-based model appeared to be helpful to participants, but was not formally evaluated, nor was any attempt made to measure movement between stages as a result of intervention.

**Recommendation 24 :** That a ‘Stages of Change’ instrument be developed and validated for use in EBP education, such as discussed by Reimsma et al (2002)<sup>9</sup>. This type of instrument could be used to (a) more objectively assess the stage of change a learner is at, and (b) determine movement between stages following education or other interventions.

**Recommendation 25 :** That the provisional theory of change (becoming an evidence-based practitioner), and the necessary conditions for change, be further explored using the existing sample or a new group of participants attending a workshop on EBP.

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<sup>9</sup> Reimsma, R.P., Pattenden, J., Bridle, C., Sowden, A.J., Mather, L., Watt, I.S., & Walker, A. (2002). A systematic review of the effectiveness of interventions based on a stages-of-change approach to promote individual behaviour change. *Health Technology Assessment*. 6(24), 1-243. (Available free in PDF format from the HTA website at [www.nchta.org](http://www.nchta.org))

# Chapter 1 BACKGROUND TO THE STUDY

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## Introduction

This report presents findings of a combined quantitative and qualitative study, based on the best available evidence on teaching and implementing evidence-based practice, and effecting change in practitioner behaviour. The overall aim of the study was to teach a group of 114 occupational therapists how to search for, appraise and apply research evidence, and then measure change in their skills, knowledge and practice over the following year.

Following a 2-day workshop on evidence-based practice in February 2002, outreach support was provided to all participants by email and telephone, and during an optional workplace visit. This support was intended to provide encouragement and practical assistance, and help promote change. Data were collected on participants' knowledge, skills, attitudes, and perceived barriers to adopting evidence-based practice on three occasions during 2002 (before and after the workshop, and at follow-up). Participants submitted diaries of their activity levels before and after the workshop (i.e. they documented engagement in search and appraisal activities, locating and reading published research). Finally, semi-structured interviews were conducted in 2003 with 10 participants, to explore the change process and the experience of becoming an evidence-based practitioner.

## Aims and Objectives

In relation to a group of occupational therapy practitioners, this study aimed to:

- **Teach** participants how to search for, appraise and apply research evidence in their everyday practice.
- **Improve skills** in database searching and critical appraisal through a training workshop and outreach support.
- **Identify and target gaps** in knowledge and barriers to the use of evidence-based practice.
- **Provide practical support**, encouragement and feedback to participants via outreach support, for 9 to 12 months after the 2-day workshop
- **Measure and monitor changes** in attitude, knowledge and skill levels during the study, and (if possible) changes in clinical practice.
- **Develop a number of evidence summaries** (or critically appraised topics/CATs) relevant to occupational therapy practice.
- **Disseminate findings** of the study and evidence summaries through a local conference, and more widely via a website.
- **Explore** the change process and participants' experiences of becoming an evidence-based practitioner.

## **Relevance of the Study to Stakeholder Groups:**

In addition to the aims and objectives stated previously, this study has relevance to the following groups. Some of the benefits are direct, some indirect.

### *The Motor Accidents Authority, Third Party Insurers and People Injured in NSW:*

*Evidence Summaries:* The evidence summaries or critically appraised topics (CATs) produced by participants have been made freely available to consumers, other professionals, and rehabilitation advisors employed by third party insurers (at [www.otcats.com](http://www.otcats.com)). The OT-CATS website is the first of its kind for occupational therapy. There is no equivalent anywhere else in the world.

*Best Practice in Injury Management:* Most people who are seriously injured in a motor vehicle accident are referred to an occupational therapist. This project has helped to raise awareness of the 'best evidence' in injury management (for example, common treatments and interventions used with people who have a traumatic brain injury, chronic pain, spinal cord injury, or back pain). Participating occupational therapists were invited to teach other professionals at their workplace and in their region, and to 'spread the word' about EBP. A number became local 'champions' and opinion leaders. Such strategies may help contribute to more cost-effective injury management, and more effective use of third party insurance funds.

*Consumer Involvement:* Two people who had been past consumers of occupational therapy services attended Steering Committee meetings, to help guide and advise on project outcomes.

### *The Occupational Therapy Profession:*

*Improved Knowledge Levels:* An increased number of occupational therapists in NSW now know how to search for, appraise and use current best evidence (this outcome was measured objectively).

*Dissemination and Transfer of Knowledge:* More 'opinion leaders' and ambassadors for evidence-based practice have been identified in NSW. Many are now marketing the benefits of using evidence to their colleagues, students and others. An end-of-project conference (held in February 2003) and the OT-CATS website further contributed to the dissemination of project results. The evidence summaries (or CATs) are now freely available and will continue to be available for several years after project completion. The website is visited by over 600 students and professionals each month. CAT and summaries can be downloaded free of charge.

*Changes in Practice:* While changes in clinical practice are more difficult to influence and measure, this project monitored changes in the way occupational therapists incorporated and used research evidence in practice.

*Contributions to Professional Accreditation:* In 2001, the Australian Association of Occupational Therapists introduced a voluntary accreditation system for continuing professional education (Accredited Occupational therapist or AccOT). Occupational therapists are required to accrue points through formal

and informal study, in order to maintain accreditation. The current research project was attractive to clinicians because it enabled them to accrue points towards AccOT while improving their knowledge, skills and professional practice.

### **Duration of the Study**

Funding approval from the MAA was received in March 2001, and the study commenced in August 2001. Funding ceased in July 2003. All data collection and analysis were complete by December 2003.

### **Funding and Expenditure**

A total of \$54,500 was contributed by the MAA towards this project. All funds have been used. Major budget items included: (a) salary costs for the project manager who contributed to the workshops, provided outreach support, and managed data collection; (b) casual employment of four research assistants (occupational therapy honours students) who helped to develop and implement study outcome measures, and conduct the interviews; and (c) travel costs associated with outreach visits.

An additional \$2000 in sponsorship funding was provided by the MAA in 2003 to support the one-day conference, where study results and evidence summaries were presented. All of these additional funds have been spent.

### **Changes in the Project**

The original study proposal (September 2000) stated that two sets of evidenced-based clinical guidelines would be developed, one focussing on traumatic brain injury and the other focussing on a different disability group. Due to the time involved in developing clinical guidelines, this aim was modified in consultation with the MAA. Instead, participants developed an evidence summary or critically appraised topic (CAT), individually or in pairs. This was the only major change in the study method from that originally proposed.

## Chapter 2 THE STUDY

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### Brief Literature Review

As a process, evidence-based practice (EBP) is about finding, appraising and applying research evidence. The process involves five steps as defined below, with each step requiring new skills and knowledge (Sackett, Straus, Richardson, Rosenberg & Haynes, 2000). The five steps are:

- Formulating a clear clinical question, preferably from a client's perspective, in preparation for conducting a search
- Searching for evidence
- Critically appraising the evidence
- Integrating evidence into practice, while also considering the clients' values and using clinical judgement and experience
- Evaluating and monitoring changes to practice.

EBP is, therefore, about *using* rather than doing research (Taylor, 2000). Research evidence should be gathered conscientiously and used judiciously in conjunction with clinical experience when making treatment decisions (Sackett et al., 2000), so that valuable health resources are used efficiently and effectively. The aim of EBP is to help practitioners identify and then cease using ineffective treatments in preference for proven effective ones. Health professionals are encouraged to identify those individuals and groups most likely to benefit from health services, and identify interventions that are more likely to result in positive outcomes for clients.

The utilisation of published research is not, however, universally accepted. Not all health professionals read about nor apply research findings in the way described. This leads to practice variations. For a number of reasons such as lack of time, a large caseload and the sheer volume of published research, many practitioners rely on what was learned at an undergraduate level or during short postgraduate courses instead of using recent research combined with clinical experience, to support their practice (Turner & Whitfield, 1997).

A further challenge facing clinicians is that changing practice and using research is not easy. Even the most motivated of clinicians will face barriers when attempting to change their practice habits. In recognition of this fact, there has been a growing body of literature which has identified and named these barriers (for example, Bennett et al., 2003; McCluskey, 2003). What is needed now is research that targets these barriers, particularly lack of time, lack of skills and knowledge, and reduced access to computers and library resources. The present study aims to help clinicians identify and then manage these barriers in a strategic way.

A review of the literature on putting evidence into practice revealed that no single educational intervention is effective. Instead, a multi-faceted approach to education is recommended, if practitioners are to apply research findings to practice (Hamer, 1999; Thomson O'Brien, Oxman, Davis, Haynes, Freemantle & Harvey, 1997; 1998). The current study therefore adopted a multi-faceted approach to education and training.

## **The Research Problem**

Occupational therapists and other health professionals are increasingly required to adopt an evidence-based approach to practice. Studies have outlined the skills required, and the barriers faced by therapists attempting to apply evidence in practice. While professionals generally have a positive attitude to EBP, they perceive many barriers (Bennett et al, 2003; McCluskey, 2003). No studies have evaluated changes in the skills, knowledge or use of evidence by occupational therapists. A multi faceted approach to education has the potential to increase the use of research evidence. However, it is unknown if this approach will be successful with occupational therapists at a local level.

## **Research Questions**

- 1) Does a combination of education and outreach support provided to occupational therapists result in changes to their:
  - Attitudes about evidence-based practice?
  - Perception of barriers to evidence based practice?
  - Level of knowledge about evidence based practice?
  - Level of skill in search and appraisal activities?
  - Level of skill in the use of research evidence?
  
- 2) What factors contribute to the increased use of research evidence by occupational therapists?

### Introduction to the Study

The study used both quantitative and qualitative methods. A cross sectional, 'before and after' study design was used to measure changes in participants' attitudes, knowledge and skill. Changes in practice were measured before and immediately after an educational intervention (the workshop), and during the outreach support phase. A qualitative component was added to the study, to investigate participants' experiences of becoming an evidence-based practitioner. Semi-structured interviews were used to collect qualitative data, up to 18 months after education had been provided.

The intervention for this study consisted of a 2-day training workshop followed by outreach support (email, telephone and a workplace visit). The outreach support was intended to address barriers experienced by participants, and to support the change process. Knowledge and skills, as well as attitudes and barriers were re-measured post-intervention. The Human Ethics Review Committee of the University of Western Sydney granted approval for this study in October 2001.

A steering committee was recruited to advise on study design, implementation and evaluation. They advised on participant recruitment, the structure and content of interventions and proposed outcomes. Committee members (**See Appendix 1**) included consumer representatives, practicing occupational therapists and other health professionals with expertise in research design and evidence-based practice. The aim was to obtain maximum benefit from the study by consulting with professionals and consumers of occupational therapy services.

### Recruitment

Recruitment commenced in November 2001. To be included in the study, participants had to be a qualified occupational therapist, and work, or intend to work in NSW during 2002. No eligibility restrictions were placed on health sector, work location or clinical specialty. The aim was to recruit at least 100 occupational therapists.

Information was distributed to: occupational therapy regional advisors; accredited rehabilitation providers; major public and private hospitals in NSW; independent occupational therapy assessors listed by the MAA Medical Assessment Service; occupational therapy focus groups; universities in NSW; non-profit organisations; specialised rehabilitation units for people with traumatic brain injury and spinal cord injury; and third party insurers. Information was also placed in the NSW state occupational therapy newsletter.

A total of 232 occupational therapists expressed interest. The first 105 occupational therapists expressing interest were sent an information package containing a formal information sheet, consent form, Survey 1 for the study, an EBP Activity Record (similar to a diary) and a reply-paid envelope. Occupational therapists were accepted into the study if they returned a signed consent form as well as the first completed survey. The information sheet is located at **Appendix 2**.

Of the first 105 occupational therapists expressing an interest, 93 agreed to participate and returned their completed survey. Information was then sent to the next 24 occupational therapists that had expressed interest. Of these 24, 21 agreed to participate,

resulting in the final sample of 114 (93 from the first round of offers, and 21 from the second round of offers). Recruitment concluded in January 2002.

## The Sample

Demographic data for the sample of 114 participating occupational therapists are shown below in Table 3.1. The majority held an undergraduate degree in occupational therapy, worked full-time in Sydney as a clinician, and had been graduated for 10 years or more. One third held a postgraduate qualification. One third worked in a regional or rural area of NSW. Just over 50% of the sample worked in the private sector.

**Table 3.1 Demographic characteristics of participants (n=114)**

Characteristic	n (%)
<b>Level of initial occupational therapy qualification</b>	
Diploma	15 (13%)
Degree	99 (87%)
<b>Time since graduation</b>	
< 5 years	29 (25%)
≥ 5 but < 10 years	19 (17%)
≥ 10 years	66 (58%)
<b>Postgraduate Qualification</b>	
Yes	42 (37%)
No	72 (63%)
<b>Enrolled in Postgraduate Study</b>	
Yes	14 (12%)
No	100 (88%)
<b>Employment Status</b>	
Full time	82 (72%)
Part time	31 (27%)
Not currently employed	1 (1%)
<b>Geographical work location (n=113)</b>	
Sydney metropolitan area	72 (64%)
Regional and rural areas	41 (36%)
<b>Primary work role (n=113)</b>	
Clinician	70 (62%)
Manager	14 (12%)
Consultant	22 (19%)
Other	7 (7%)
<b>Primary work sector(n=113)*</b>	
Public*	55 (49%)
Private*	58 (51%)

Public sector included NSW Health Dept, the Dept of Community Services, CRS Australia (Commonwealth Rehabilitation Service) and universities. Private sector included private practice, private hospital settings, private rehabilitation providers and charitable/non government organisations.



## **Interventions**

There were two interventions: A 2-day workshop on evidence-based practice and outreach support. Each will be described in sufficient detail to allow replication.

*(a) The 2-day training workshop:* The principal researcher conducted workshops with the assistance of a project manager and health librarian from the University of Western Sydney. The workshops were conducted at the Bankstown Campus of the university. Three 2-day workshops were conducted in February 2002, each providing the same content but on different weekends over the month. The workshop included the following topics:

- Identifying and overcoming barriers to EBP;
- The process of change management;
- Searching electronic databases for research literature;
- Understanding and interpreting statistics in randomised controlled trials;
- Critical appraisal of qualitative and quantitative research.

During the workshop, participants developed an individual learning contract to help them apply learning after the workshop. An additional evening workshop was offered three times in the evening in February, for participants with limited or no prior knowledge of EBP. The evening sessions provided an introduction to the concepts of EBP, in preparation for the workshop. Attendance at the evening sessions was voluntary. Attendance at the 2-day workshop was compulsory.

*(b) Outreach Support:* Outreach support consisted of email and telephone contact by the project manager with participant and an optional workplace visit. Participants were also encouraged to assist each other where appropriate. The purpose of the workplace visit was to provide tailored assistance to monitor participants' progress with the EBP Activity Record and their critically appraised topic. An electronic email list was set up to facilitate communication among participants. Information distributed via this list included EBP resources and websites, project reminders and general information sharing from participants. Participants could also email or telephone the project manager directly. Outreach support commenced in March 2002 after the workshops and officially concluded in December 2002.

## **Data Collection Instruments**

Three instruments were used to measure change in participant attitudes, skills, knowledge and level of activity.

### *(a) Survey Questionnaire*

To evaluate change in attitudes skills and knowledge, participants were asked to complete an 8-page survey questionnaire on three occasions: before, directly after the workshop and at the conclusion of the outreach support (9 months later). The survey was designed to obtain self-reported as well as objective information related to skills and knowledge, and is available upon request. The survey was developed from existing instruments (Bennett et al., 2003; McCluskey, 2003; Ramos et al., 2003; Upton & Lewis, 1998) and took approximately 40 minutes to complete, including section 4, the Adapted Fresno Test of EBP.

Survey 1 was pilot tested during October/November 2001 with eight occupational therapists from across Queensland, Northern Territory, Tasmania, Western Australia, and the United Kingdom, and one physiotherapist in NSW. Minor changes were made to the content, layout and formatting of the survey in response to feedback.

The survey questionnaire contained four sections. **Section 1** recorded demographic data, information access to the internet and World Wide Web, any barriers experienced, and strategies implemented to overcome barriers. **Section 2** required participants to rank (from 1 to 5) how frequently they relied on different sources of information when making treatment decisions. **Section 3** evaluated attitudes, knowledge and skill by asking each participant whether they 'agreed', 'disagreed' or were 'unsure' in response to specific statements. An example of a statement was: 'The Cochrane database is good to look for high quality research'.

*(b) The Adapted Fresno Test of EBP*

**Section 4** of the survey aimed to objectively evaluate skills and knowledge using the Fresno Test of EBM (Ramos et al., 2003). This test was adapted for use with occupational therapists. A total of six new clinical scenarios were written representing clinical problems relevant to occupational therapy. Participants were required to choose one of two clinical scenarios presented, and answer seven related questions as follows:

1. "Write a focused clinical question for **ONE** scenario to help you organise a search of the literature"
2. "Where might you find answers to these and other similar clinical questions? Name as many as possible sources of information as you can -not just the ones you think are good sources. Describe the most important advantages and disadvantages of each source listed"
3. "What type of study (design) would best answer your clinical question and why?"
4. "If you were to search Medline for original research to answer your question, describe the search strategy you might use. Be as specific as you can about topics and search categories (fields) you would use. Explain your rationale. Describe how you might limit your search"
5. "When you find a report of original research on this question or any others, what characteristics of the study will you consider to determine if it is relevant?"
6. "When you find a report of original research, what characteristics of the study will you consider to determine if its findings are valid?"
7. "When you find a report of original research, what characteristics of the study will you consider to determine magnitude and significance (clinical and statistical)?"

**Figure 3.1 Questions from the Adapted Fresno Test of EBP**

The clinical scenarios differed for Survey Version 1, 2 and 3. Diagnoses included in the clinical scenarios were low back pain, traumatic brain injury, occupational overuse syndrome, depression, osteoarthritis and carpal tunnel syndrome. Interventions included transcutaneous nerve stimulation (TENS), group education programs, workplace exercises, cognitive behaviour therapy, exercise programs and splinting.

Each question in the Adapted Fresno Test of EBP was scored according to specific criteria. For example, Question 2 seeks a list of possible sources of information that may provide answers to the clinical question. Participants are also asked to list the advantages and disadvantages of each source. Participants could score up to 24 points for this question depending upon how many sources of information were named and how many issues were identified relating to the convenience, clinical relevance and validity of the information source. The maximum possible score overall for the Adapted Fresno Test of EBP was 153 (marking grid used to score the Adapted Fresno Test of EBP available upon request).<sup>10</sup>

The Adapted Fresno Test of EBP was evaluated for interrater reliability (Bishop & McCluskey, 2003). Using computerised random numbers, 10 completed surveys were selected from pre-workshop records, and another 10 from post-workshop records. These records were independently marking by three raters. A value of .75 was chosen as a measure of satisfactory interrater reliability. Interrater reliability results ranged from satisfactory to excellent (.78 to .99 for the pre-workshop test and .75 to .99 for the post-workshop test). One result from each sample fell below the value of .75. (Pre workshop test: Question 4.3 = .46, Post workshop test: Question 5.1 = .57). Overall the test was found to be sufficiently reliable to detect an improvement in knowledge, and results will be written up for publication in the near future.

### *(c) The EBP Activity Record<sup>11</sup>*

To measure change in activity levels and use of evidence, participants were asked to complete an 'EBP Activity Record', developed by the principal researcher and project manager. Participants were asked to record any EBP-related activity that they had engaged in, what prompted the activity, the time taken to conduct the activity and whether the activity had influenced their practice in any way. Participants were asked to complete the record for 3 weeks before, and for 8 months after the workshop. Records were collected electronically or by fax on a bi-monthly basis from March to October 2002 (i.e. at the end of April, June, August and October). A copy of the EBP Activity Record is available upon request.

Responses were categorised and coded as follows: type of activity, time of day, what or who prompted the activity, sources of information used to locate evidence and changes in practice as a result of the activity. In summary, the following outcome measures were obtained from the EBP Activity records for each of the time periods:

- Frequency of EBP-related activities
- Number and percentage of participants engaged in each activity
- Time of day for activity completion
- Mean number of activities per week

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<sup>10</sup> Acknowledgement: Adapted Fresno Test of EBP scoring criteria developed, and reliability study completed jointly with Bianca Bishop for a 4<sup>th</sup> year occupational therapy honours thesis, UWS, 2002.

<sup>11</sup> Acknowledgement: EBP Activity Record developed, and data analysis conducted jointly with Valerie Cupitt, as part of a 4<sup>th</sup> year occupational therapy honours thesis, UWS, 2002.

## Semi structured interviews

In early 2003, 10 occupational therapists who had been actively engaging in EBP were invited to participate in an interview. These participants were purposively selected based on the results of Survey 3 and from EBP Activity Records returned throughout 2002. The aim of the interviews was to select participants who had shown an increase in skills and knowledge, or had been particularly active in relation to EBP. All participants were employed in NSW, Australia and worked in either the public or private health sector. Demographic characteristics of the interview sample are summarised in Table 3.2.

**Table 3.2 Characteristics of the Interview Sample (n=10)**

Characteristic	n (%)
<b>Level of initial occupational therapy qualification</b>	
Diploma	2 (20%)
Degree	8 (80%)
<b>Time since graduation</b>	
< 5 years	2 (20%)
≥ 5 but < 10 years	1 (10%)
≥ 10 years by < 20 years	5 (50%)
≥ 10 years	2 (20%)
<b>Postgraduate Qualification</b>	
No	5 (50%)
Yes	5 (50%)
<b>Enrolled in Postgraduate Study</b>	
Yes	0 (0%)
No	10 (100%)
<b>Employment Status</b>	
Full-time	8 (80%)
Part-time	2 (20%)
<b>Geographical work location</b>	
Sydney metropolitan area	4 (40%)
Regional and rural areas	6 (60%)
<b>Number of Barriers to EBP reported in Survey 3</b>	
Less than 5	4 (40%)
≥ 5 but < 10	5 (50%)
≥ 10	1 (10%)

Data were collected during a single interview with each participant. The aim was to understand the experiences of participating occupational therapists with regard to the change process and becoming an evidence-based practitioner.

Interviews were conducted by two final year occupational therapy honours students from the University of Western Sydney, and formed the major part of their honours thesis. Each interview was one to two hours long and took place at an agreed location and time. Interviews were primarily conducted at participants' work places (n = 7). Three

interviews were conducted by telephone due to distance. One interview was conducted in the participant's home.

The two student researchers developed a list of questions, in consultation with the chief investigator. Questions were pilot tested with two study participants during face-to-face interviews, and one by telephone. None of these participants were included in the final sample. Pilot interviews allowed the students to gain interview experience and trial the questions. The interview questions were based on issues identified from literature and designed to elicit responses relevant to study aims without leading the participants' answers. Minor changes were made to the questions following the pilot interviews. The final questions are listed below in Table 3.3.

### **Table 3.3 Interview Questions**

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- "Please tell me a little about your work area, your caseload (if you have one), and how long you have been in your current position."
- "Last year you attended a two-day workshop on evidence-base practice. What happened after that, between then and now?"
- "Tell me about any factors that you think might have helped or hindered your ability to put ideas into practice at work following the workshop."
- "What do you think being an 'evidence-based occupational therapist' means?"
- "Can you describe a professional you know whom you consider to be evidence-based?"
- "Are you an evidence-based occupational therapist?"

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While conducting the interviews, the technique of funnelling was used. Funnelling is a form of questioning where the interviewer starts with broad, general questions. These encourage participants to think about an issue in general terms. As the participants tell their story, the interviewer guides them towards more explicit issues by asking specific questions (Minichiello, 1995). With participants' permission, all interviews were taped on two separate recorders (in case of battery or tape failure). The taped interviews were transcribed by the student researchers. This process ensured that a complete record of the interview was gained.

Analysis of the data began during the collection stage and employed a grounded theory approach. Data were coded, to identify and relate concepts within the interview data (Creswell, 1998). Once data were coded, they were analysed using the constant comparative method (Strauss & Corbin, 1998).

### **Critically Appraised Topics (CATs)**

Participants were invited to prepare a critically appraised topic or summary of evidence (individually or in pairs/small groups) on a topic of relevance to their practice. This process provided an opportunity for participants to practice skills gained during the

workshop and develop a resource for use by other occupational therapists. The project manager developed a template and sample CAT that was then used by participants (see **Appendix 3**). Participants were asked to submit their CAT by December 2002.

### **Data Analysis**

Quantitative data were analysed using SPSS software (Version 11: SPSS, Chicago, IL, USA). Frequency distributions were primarily used to summarise quantitative data collected from the three surveys and the EBP Activity Records

Qualitative data were analysed using grounded theory methods, and involved open, axial and selective coding. Text data were cut and pasted from the transcribed interviews into Word files with category titles such as ‘ Barriers’ and ‘Readiness for change’. Coding allowed the researchers to collate quotes about strategies that participants used to apply evidence and to manage barriers, and factors or conditions that influenced their use of such strategies.

## Chapter 4 CHANGE OVER TIME

This study aimed to measure change in attitudes, perceived barriers, level of knowledge, skill and use of research evidence by occupational therapists who had received training and outreach support. Results are presented in the following order:

- i. Number and type of perceived barriers
- ii. Attitudes to EBP
- iii. Skills and knowledge
- iv. Activity levels
- v. Summaries of evidence

Eighty-eight (n=88) participants completed the study, representing 77% of the original sample of 114. Dropouts and the reason for dropouts will be discussed later in this chapter.

### Number and Type of Perceived Barriers

The number and percentage of respondents reporting perceived barriers pre and post workshop, and at follow up are presented in Table 4.1 below. Lack of time and a large workload/caseload were the most commonly reported barriers on all three occasions. A higher percentage of participants (94%) reported lack of time as a barrier to EBP post-workshop compared to pre workshop (75%). There were no other changes in reported barriers from pre workshop to post workshop.

There was a decrease in the number of participants reporting the following barriers: professional isolation, limited searching skills, limited critical appraisal skills, use of research evidence not being a priority, lack of evidence to support occupational therapy practice and the large volume of published research. There were no other changes in reported barriers.

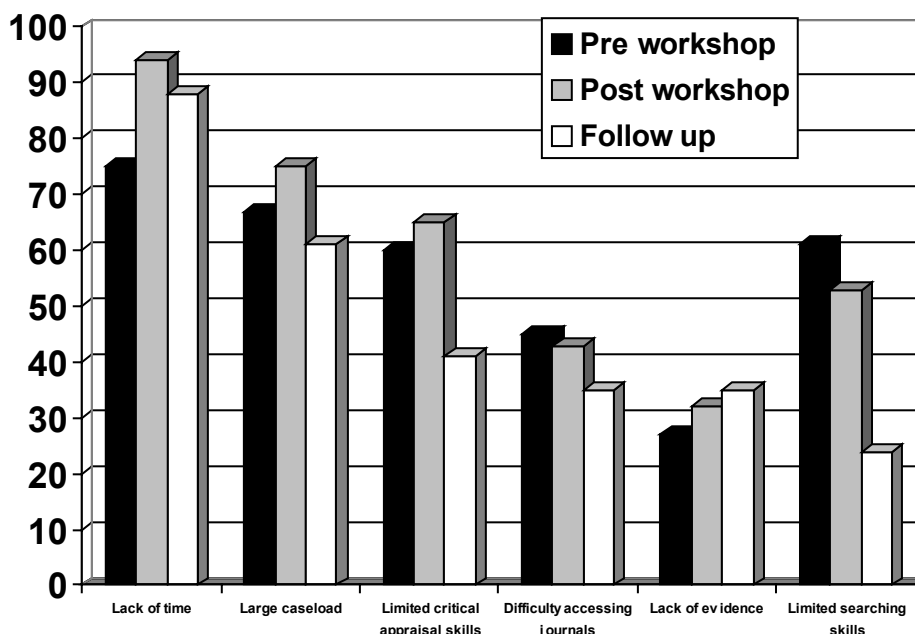


Figure 4.1 Perceived barriers to adopting EBP

**Table 4.1 Perceived barriers to adopting EBP**

<b>Barriers Reported</b>	<b>Pre n=114</b>	<b>Post n=106</b>	<b>Follow-up n= 51</b>
Lack of time	86 (75%)	100 (94%)	45 (88%)
Large workload/caseload	76 (67%)	79 (75%)	31 (61%)
Limited searching skills	69 (61%)	56 (53%)	12 (24%)
Limited critical appraisal skills	68 (60%)	69 (65%)	21 (41%)
Difficulty accessing journals	51 (45%)	45 (43%)	18 (35%)
The large volume of published research	33 (29%)	34 (32%)	7 (14%)
Lack of evidence to support what we do in OT	31 (27%)	34 (32%)	18 (35%)
Professional isolation	24 (21%)	28 (26%)	7 (14%)
Limited resources and funding to support change to EBP	23 (20%)	13 (12%)	4 (8%)
Difficulty accessing a computer	19 (17%)	15 (14%)	6 (12%)
Entrenched workplace behaviours and habits	15 (13%)	21 (20%)	6 (12%)
Use of research evidence is not a priority where I work	14 (12%)	21 (20%)	4 (8%)
Benefits and advantages of adopting EBP are not clear	11 (10%)	6 (6%)	0 (0%)
Limited support for continuing education where I work	9 (8%)	8 (8%)	1 (2%)
My own lack of interest/enthusiasm	7 (6%)	6 (6%)	3 (6%)
Lack of supervisor interest and support	4 (4%)	11 (10%)	2 (4%)
Lack of management interest and support	5 (4%)	14 (13%)	4 (8%)
<i>Other: Financial constraints</i>	1 (1%)	0 (0%)	0 (0%)
<i>Other: Unsure 'where to start'</i>	2 (2%)	0 (0%)	0 (0%)
<i>Other: Climate of organisational change</i>	0 (0%)	1 (1%)	0 (0%)
<i>Other: Community and other agencies expectations</i>	0 (0%)	1 (1%)	0 (0%)
<i>Other: Lack of EBP skill amongst staff</i>	0 (0%)	0 (0%)	1 (1%)
<i>Other: Isolating OT interventions within a team-based intervention</i>			

NOTE: Participants were asked to choose as many barriers as they wished from the list, therefore the numbers do not add up to 100%. Participants were also asked to identify 'other barriers'.



Almost all participants had access to the internet, before and after the workshop, and at follow up (see Table 4.2 below). Over one quarter of participants (28%) did not have access to the internet at work before the workshop. This statistic increased only slightly at follow up.

**Table 4.2 Access to and use of the Internet**

<b>Internet access and use</b>	<b>Pre</b> n = 114	<b>Post</b> n = 106	<b>Follow up</b> n= 51
<b>Access to the internet</b>			
Yes	107 (94%)	103 (97%)	50 (98%)
No	7 (6%)	3 (3%)	1 (2%)
<b>Access to internet at work</b>			
Yes	79 (72%) <sup>a</sup>	79 (74%)	36 (77%) <sup>b</sup>
No	31 (28%) <sup>a</sup>	27 (26%)	11 (23%) <sup>b</sup>
<b>Access to the internet at home</b>			
Yes	80 (73%) <sup>a</sup>	71 (97%)	36 (77%) <sup>c</sup>
No	30 (27%) <sup>a</sup>	35 (33%)	11 (23%) <sup>c</sup>
<b>Use of internet in past 4 weeks for work (excluding email)</b>			
Yes	76 (67%)	82 (77%)	35 (71%) <sup>b</sup>
No	37 (22%)	24 (23%)	14 (29%) <sup>b</sup>

*Note:* <sup>a</sup>n=110; <sup>b</sup>n=49; <sup>c</sup>n=47

## Attitudes to EBP

After the workshop, there was an 11% increase in the number of participants that disagreed with the statement '*Adoption of EBP places too many demands on me*' and who agreed with the statement '*EBP allows OTs to follow guidelines without clinical judgment*'. The attitudinal statements that changed over time in more than one quarter (25% or more) of participants included: '*EBP is of limited value in OT due to lack of evidence*' (an increase of 31%); '*EBP is client centred*' (an increase of 26%); and '*It is important to write a clinical question before conducting a search*' (an increase of 25%). There were no other changes in attitudes from pre workshop to post workshop. At follow-up, there were no marked changes in participant attitude to EBP.

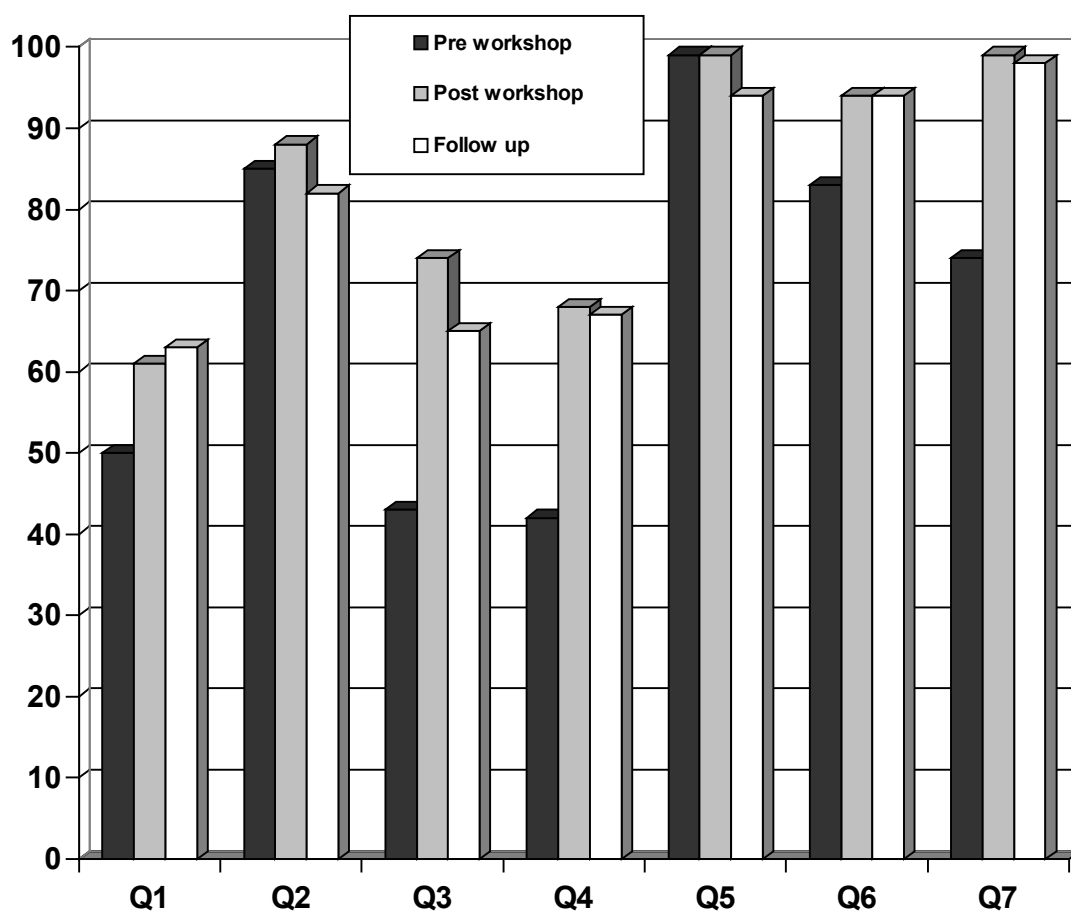


Figure 4.2 Changes in attitudes to EBP

**Table 4.3 Attitudes to EBP**

<b>Question</b>	<b>Pre n = 114</b>	<b>Post n = 106</b>	<b>Follow-up n= 51</b>
<i>Q1 The adoption of EBP, however worthwhile as an ideal, places too many demands on me and my workload</i>			
<b>Agree</b>	<b>20 (18%)</b>	<b>14 (13%)</b>	<b>13 (25%)</b>
Disagree	57 (50%)	64 (61%)	32 (63%)
Unsure	37 (32%)	28 (26%)	6 (12%)
<i>Q2 EBP improves client care</i>			
<b>Agree</b>	<b>97 (85%)</b>	<b>93 (88%)</b>	<b>42 (82%)</b>
Disagree	0 (0%)	1 (1%)	0 (0%)
Unsure	17 (15%)	12 (11%)	9 (18%)
<i>Q3 EBP is of limited value in occupational therapy because there is not enough research evidence</i>			
<b>Agree</b>	<b>14 (12%)</b>	<b>5 (5%)</b>	<b>10 (20%)</b>
Disagree	49 (43%)	77 (74%)	33 (65%)
Unsure	51 (45%)	24 (23%)	8 (15%)
<i>Q4 EBP is client centred</i>			
<b>Agree</b>	<b>48 (42%)</b>	<b>72 (68%)</b>	<b>34 (67%)</b>
Disagree	12 (11%)	10 (10%)	3 (6%)
Unsure	54 (47%)	27 (22%)	14 (27%)
<i>Q5 EBP is important to occupational therapy</i>			
<b>Agree</b>	<b>113(99%)</b>	<b>105(99%)</b>	<b>48 (94%)</b>
Disagree	0 (0%)	1 (1%)	1 (2%)
Unsure	1 (1%)	0 (0%)	2 (4%)
<i>Q6 The practice of EBP allows occupational therapists to follow guidelines without having to exercise their clinical judgement.</i>			
<b>Agree</b>	<b>5 (4%)</b>	<b>5 (5%)</b>	<b>2 (4%)</b>
Disagree	95 (83%)	100 (94%)	48 (94%)
Unsure	14 (13%)	1 (1%)	1 (2%)
<i>Q7 It is important to write a clinical question before conducting a search for evidence, because this approach improves efficiency and the likelihood of finding relevant material</i>			
<b>Agree</b>	<b>84(74%)*</b>	<b>105(99%)</b>	<b>50 (98%)</b>
Disagree	1 (1%)*	0 (0%)	0 (0%)
Unsure	29 (25%)*	1 (1%)	1 (1%)

Note: \*n=113

## Self-Reported Skills and Knowledge

Changes in self-reported skills and knowledge are shown in Table 4.4. Post-workshop, there was an increase in self-reported skills and knowledge for four of the seven items. Increases were reported in relation to: awareness and use of a range of electronic databases (up 48%); confidence generating a clinical question (up 49%), ability to conduct a computer search alone (up 42%) and having the confidence to review and evaluate practice (up 12%).

**Table 4.4 Self-reported skills and knowledge**

<i>Self Reported Skills and Knowledge</i>	Pre n = 114	Post n = 106	Follow up n= 51
I feel confident that I can generate a clinical question			
<b>Agree</b>	<b>38 (33%)</b>	<b>87 (82%)</b>	<b>48 (94%)</b>
Disagree	31 (27%)	2 (2%)	0 (0%)
Unsure	45 (40%)	17 (16%)	3 (6%)
I am aware of and have used a range of electronic databases			
<b>Agree</b>	<b>51 (45%)</b>	<b>99 (93%)</b>	<b>51 (100%)</b>
Disagree	50 (44%)	3 (3%)	0 (0%)
Unsure	13 (11%)	4 (4%)	0 (0%)
I am able to conduct a computer search on own			
<b>Agree</b>	<b>49 (43%)</b>	<b>90 (85%)</b>	<b>47 (92%)</b>
Disagree	31 (27%)	3 (3%)	4 (8%)
Unsure	34 (30%)	13 (12%)	0 (0%)
I am confident about my general computer skill such as using the internet			
<b>Agree</b>	<b>86 (75%)</b>	<b>85 (80%)</b>	<b>49 (96%)</b>
Disagree	16 (14%)	8 (8%)	0 (0%)
Unsure	12 (11%)	13 (12%)	2 (4%)
I feel confident that I can critically appraise research evidence			
<b>Agree</b>	<b>20 (18%)</b>	<b>25 (24%)</b>	<b>18 (36%)</b>
Disagree	41 (36%)	22 (21%)	15 (30%)
Unsure	53 (46%)	59 (55%)	17 (34%)
I feel confident that I can review and evaluate my practice			
<b>Agree</b>	<b>49 (43%)</b>	<b>58 (55%)</b>	<b>37 (73%)</b>
Disagree	11 (10%)	7 (7%)	5 (10%)
Unsure	54 (47%)	41 (38%)	9 (17%)
I feel confident that I can change my practice in response to new evidence			
<b>Agree</b>	<b>87 (76%)</b>	<b>78 (74%)</b>	<b>40 (78%)</b>
Disagree	1 (1%)	0 (0%)	2 (4%)
Unsure	26 (23%)	28 (26%)	9 (18%)

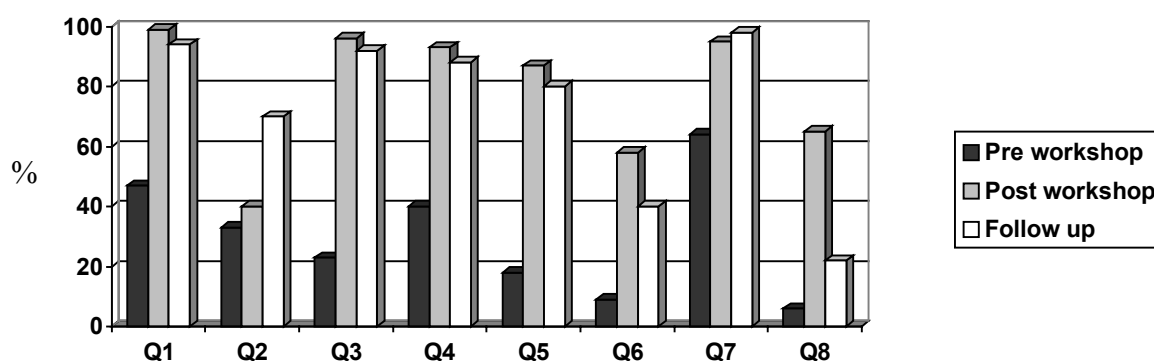
There were no notable changes in relation to general computer skill, confidence in appraising research evidence, or confidence in ability to change practice in response to new evidence.

At follow-up, there was an increase in self-reported skills and knowledge for four of the seven test items, compared to post-workshop responses. Increases in skills and knowledge were reported in relation to generating a clinical question (12%), general computer and internet skills (16%), ability to critically appraise research evidence (12%) and ability to review and evaluate practice (18%). There were no marked changes at follow up in relation to awareness and use of electronic databases, ability to conduct a computer search on own and ability to change practice in response to new evidence.

### Knowledge Test Questions

The proportions of ‘correct’ answers for each test question are shown in Table 4.5 and Figure 4.3. Knowledge levels increased substantially for seven out of the eight items after the workshop. Increases were reported for the following questions:

- Q.1: ‘A good clinical question consists of the PICO format’ (answered ‘yes’ correctly by 52% more of the sample compared to pre workshop);
- Q.3: ‘An electronic database such as PubMed can only be accessed from hospital/uni libraries’ (answered ‘no’ correctly by 73% more of the sample compared to pre workshop);
- Q.4: ‘The Cochrane database is good to look for high quality evidence’ (answered ‘yes’ correctly by 53% more of the sample compared to pre workshop);
- Q.5: ‘Confidence intervals are a measure of clinical significance’ (answered ‘yes’ correctly by 69% more of the sample compared to pre workshop);
- Q.6: ‘The P value is a measure of reliability’ (answered ‘no’ correctly by 17% more of the sample compared to pre workshop);
- Q.7: ‘Single case designs are regarded as a similar level of evidence as an RCT’ (answered ‘no’ correctly up 31% more of the sample compared to pre workshop);
- Q.8: ‘There is a recognised hierarchy of evidence for qualitative research’ (answered ‘no’ correctly by 59% more of the sample compared to pre workshop).



**Figure 4.3 Percentage of correct answers to questions 1 to 8**

At follow-up, there was little or no change in knowledge levels compared to post workshop for six out of the eight items. There was, however, a substantial increase in the proportion of participants that *correctly disagreed* with the statement ‘Databases such as Medline/Pubmed contain only high quality evidence’ (up by 30% at follow-up compared to post-workshop).

**Table 4.5 Knowledge Test Questions**

Knowledge Test Questions	Pre n = 114	Post n = 106	Follow-up n= 51
<i>Q1 A good clinical question consists of an intervention, the target population, the outcome, and a comparison intervention</i>			
Agree	<b>53 (47%)</b>	<b>105 (99%)</b>	<b>48 (94%)</b>
Disagree	3 (3%)	1 (1%)	1 (2%)
Unsure	57 (50%)	0 (0%)	2 (4%)
<i>Q2 Databases of primary medical literature, such as Medline/Pubmed generally contain a compilation of only high quality evidence</i>			
Agree	8 (7%)	33 (31%)	10 (20%)
<b>Disagree</b>	<b>38 (33%)</b>	<b>42 (40%)</b>	<b>35 (70%)</b>
Unsure	68 (60%)	31 (29%)	5 (10%)
<i>Q3 An electronic database such as PubMed can only be accessed from hospital and university libraries</i>			
Agree	2 (2%)	2 (2%)	3 (6%)
<b>Disagree</b>	<b>26 (23%)</b>	<b>102 (96%)</b>	<b>47 (92%)</b>
Unsure	86 (75%)	2 (2%)	1 (2%)
<i>Q4 The Cochrane Database is a good place to look for reviews of high quality research based on clearly stated criteria, in many areas of clinical practice.</i>			
Agree	<b>46 (40%)</b>	<b>98 (93%)</b>	<b>45 (88%)</b>
Disagree	1 (1%)	0 (0%)	1 (2%)
Unsure	67 (59%)	8 (7%)	5 (10%)
<i>Q5 Confidence intervals are a measure of clinical significance, and provide a way of estimating where the 'true' result for any population lies.</i>			
Agree	<b>20 (18%)</b>	<b>92 (87%)</b>	<b>41 (80%)</b>
Disagree	2 (1%)	8 (7%)	2 (4%)
Unsure	92 (81%)	6 (6%)	8 (16%)
<i>Q6 The P value is a measure of reliability</i>			
Agree	18 (16%)	35 (33%)	18 (36%)
<b>Disagree</b>	<b>10 (9%)</b>	<b>61 (58%)</b>	<b>20 (40%)</b>
Unsure	85 (75%)	10 (9%)	12 (24%)
<i>Q7 Single case designs are regarded as a similar level of evidence as randomised controlled trials.</i>			
Agree	1 (1%)*	1 (1%)	0 (0%)
<b>Disagree</b>	<b>72 (64%)*</b>	<b>101 (95%)</b>	<b>50 (98%)</b>
Unsure	40 (35%)*	4 (4%)	1 (2%)
<i>Q8 There is a recognised hierarchy of evidence (levels of evidence) for qualitative research</i>			
Agree	60 (53%)*	31 (29%)	34 (67%)
<b>Disagree</b>	<b>7 (6%)*</b>	<b>69 (65%)</b>	<b>11 (22%)</b>
Unsure	46 (41%)*	6 (6%)	6 (12%)

Note: Bold text indicates the correct response to the knowledge question. \* n=113

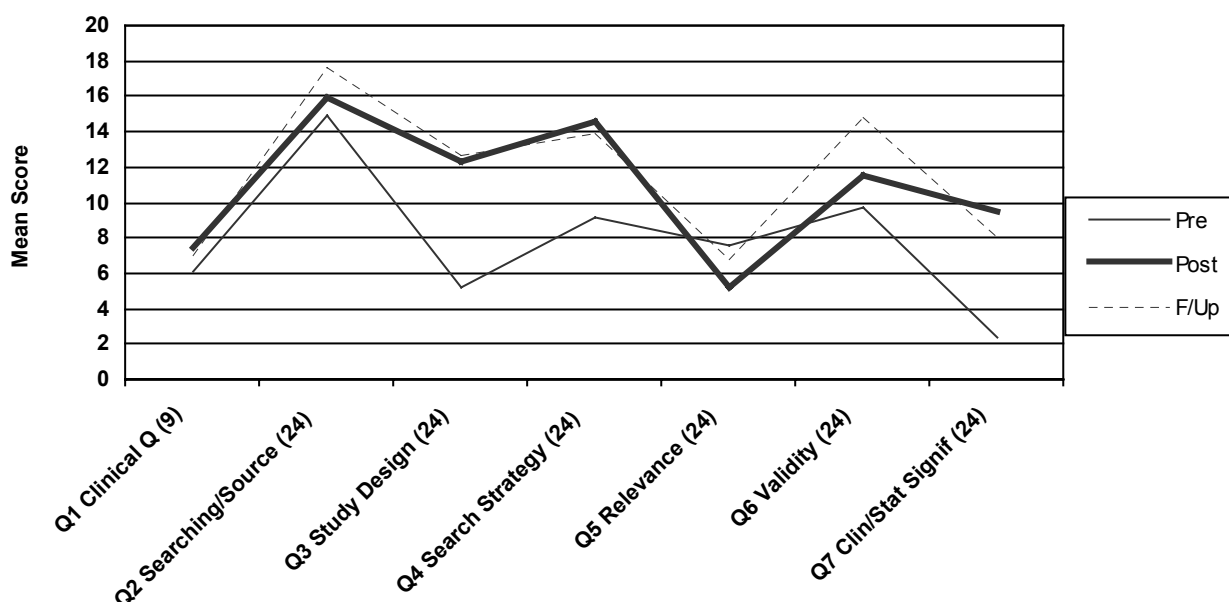
## Additional Knowledge Test: The Adapted Fresno Test of EBP<sup>12</sup>

Changes in knowledge level were also measured using the Adapted Fresno Test of EBP. The mean score for the sample pre-workshop was 57 (range 0 to 123) out of a possible 153. The mean score post-workshop was 78 (range 29 to 121). The mean score at follow up was 80 (range 36 to 152). These scores indicate a substantial increase in knowledge. However, there was only a small change in knowledge from post-workshop to follow up. Mean scores for each question on the Adapted Fresno Test of EBP are presented in Table 4.6 and Figure 4.4.

**Table 4.6 Mean scores for the Adapted Fresno Test of EBP**

Question	Pre n=114	Post n=106	Follow-up n=51
Q1	6	7.5	7
Q2	15	16	18
Q3	5	12	13
Q4	9	15	14
Q5	8	5	7
Q6	10	11	15
Q7	2	9	8
Total out of 153	57	76	80

**Figure 4.4 Mean scores for each question on the Adapted Fresno Test of EBP**



<sup>12</sup> Acknowledgement: Results prepared jointly with Bianca Bishop, as part of a 4<sup>th</sup> year occupational therapy honours thesis, UWS, 2002.

## Frequency of EBP Activities<sup>13</sup>

The frequency of each EBP-related activity is presented below in Table 4.7. There was an increase overall in activity levels in the first eight weeks after the workshop, compared to before. For example, of the 102 participants before the workshop who reported any activity, there were 99 occasions of searching overall, 53 occasions of reading, 14 occasions of appraisal and 6 involving teaching other about EBP. In March and April, there were 79 participants who reported engaging in some activities, with 121 occasions of searching, 33 occasions of reading, and so on. However, there was a steady decline in the proportion of participants engaging in each activity thereafter.

Searching for evidence was the most frequently performed activity (total of 364 occasions over 9 months) followed by reading (total of 163 occasions over 9 months). Teaching others about EBP was common in the first eight weeks after the workshop.

**Table 4.7 Frequency of EBP activities for each of the five time periods**

<b>Activity</b>	Occasions Pre n= 102	Occasions Mar – Apr n= 79	Occasions May – Jun n= 57	Occasions Jul – Aug n= 47	Occasions Sept – Oct n= 40	<b>Total</b>
Searching <sup>a</sup>	99	121	56	52	36	364
Reading <sup>b</sup>	53	33	34	11	32	163
Appraisal <sup>c</sup>	14	24	19	11	17	85
Teaching <sup>d</sup>	6	25	14	2	2	49
<b>TOTAL</b>	<i>172</i>	<i>203</i>	<i>123</i>	<i>76</i>	<i>87</i>	<i>661</i>

Notes:

<sup>a</sup> Searching via online databases/websites.

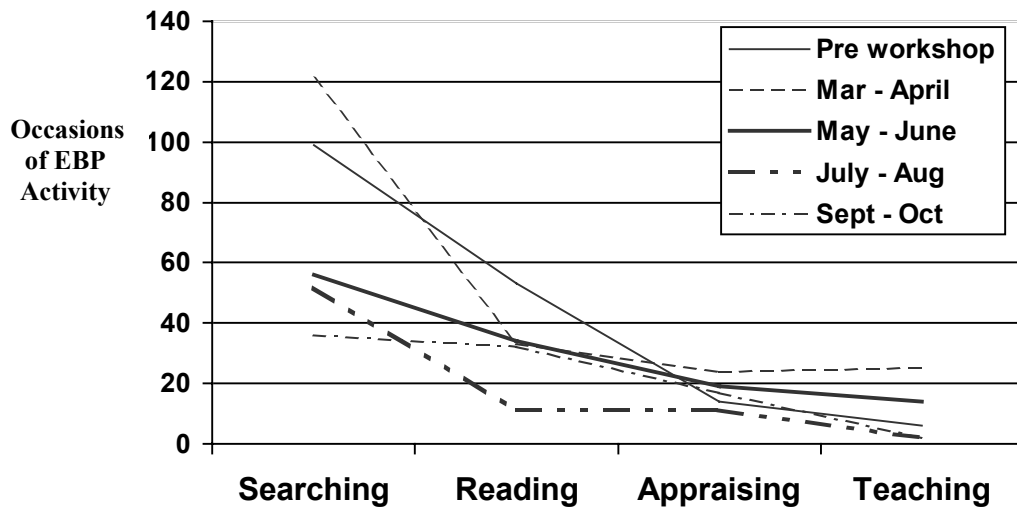
<sup>b</sup> Reading without using a critical appraisal checklist

<sup>c</sup> Critical appraisal involving the use of a checklist.

<sup>d</sup> Teaching referred to any formal teaching, or preparation for a teaching session, that was related to EBP.

<sup>13</sup> Acknowledgement: Results prepared jointly with Valerie Cupitt as part of a 4<sup>th</sup> year occupational therapy honours thesis, UWS, 2002

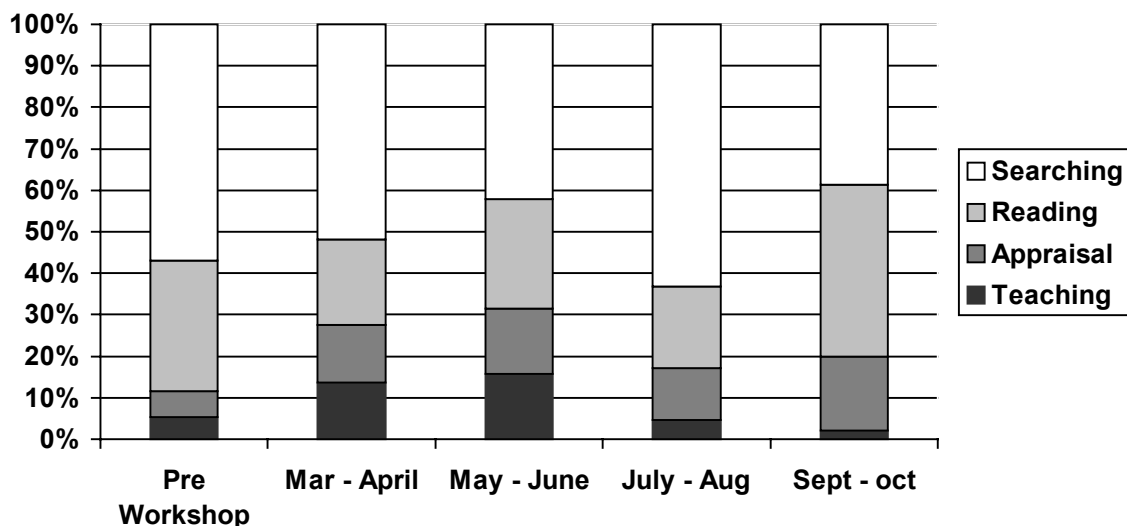




**Figure 4.5** Frequency and total occasions of EBP activities

*(a) Participants engaging in each EBP-Related Activity*

The number and percentage of participants engaging in each EBP related activity are shown in Figure 4.6 below, and Table 4.8 over the page. The main finding was that activity levels were low initially and remained low. Searching was the most popular activity, followed by reading (without appraisal). Only a small proportion of participants used the skills and knowledge acquired at the workshop, suggesting that application of skills continues to be a challenge for professionals upon return to work.



**Figure 4.6** Participants engaging in any EBP-related activity (i.e. at least once) for each of the five time periods

**Table 4.8 Participants engaging in EBP-related activities [once/ twice or more] for each of the five time periods**

<b>Frequency of engagement</b>	<b>Pre</b> n = 102	<b>Mar-Apr</b> n = 79	<b>May-Jun</b> n = 57	<b>Jul-Aug</b> n = 47	<b>Sep-Oct</b> n = 40
<b>Searching</b>					
Nil occasions	46 (45.1%)	25 (31.6%)	28 (49.1%)	21 (44.6%)	25 (62.5%)
Once	28 (27.4%)	22 (27.8%)	16 (28.1%)	14 (29.8%)	4 (10.0%)
Twice or more	28 ( <b>27.4%</b> )	32 ( <b>40.5%</b> )	13( <b>22.8%</b> )	12 ( <b>25.5%</b> )	11 ( <b>27.5%</b> )
<b>Reading</b>					
Nil occasions	71 ( <b>69.6%</b> )	58 ( <b>73.4%</b> )	39( <b>68.4%</b> )	39 ( <b>83.0%</b> )	24 ( <b>60.0%</b> )
Once	16 (15.6%)	14 (17.7%)	10 (17.5%)	5 (10.6%)	7 (17.5%)
Twice or more	15 (14.7%)	7 (8.9%)	8 (14.0%)	3 (6.3%)	9 (22.5%)
<b>Appraisal</b>					
Nil occasions	96 ( <b>94.1%</b> )	65 ( <b>82.3%</b> )	46( <b>80.7%</b> )	42 ( <b>89.4%</b> )	33 ( <b>82.5%</b> )
Once	3 (2.9%)	8 (10.1%)	5 (8.8%)	3 (6.4%)	6 (15.0%)
Twice or more	3 (2.9%)	6 (7.6%)	6 (10.5%)	2 (4.3%)	1 (2.5%)
<b>Teaching</b>					
Nil occasions	97 (95.1%)	65 (82.3%)	46 (80.7%)	45 (95.7%)	39 (97.5%)
Once	4 (3.9%)	6 (7.6%)	8 (14.0%)	2 (4.2%)	0 (0.0%)
Twice or more	1 (1.0%)	8 (10.1%)	3 (5.3%)	0 (0.0%)	1 (2.5%)

*(b) Mean number of EBP-related activities per week*

The mean number of EBP-related activities per week are shown in Table 4.9. The total number of occasions for each 8 week period was divided by 8, giving an average or mean frequency per week for the sample. The average number of activities declined over time.

**Table 4.9 Mean number of EBP related activities per week**

<b>Activity</b>	<b>Pre</b> n = 102	<b>Mar-Apr</b> n = 79	<b>May-Jun</b> n = 57	<b>Jul-Aug</b> n = 47	<b>Sep-Oct</b> n = 40
Searching	33	14	6	6	4
Reading	18	4	4	1	4
Appraisal	5	2	2	1	2
Teaching	2	3	2	0	0
<b>Total</b>	<b>57</b>	<b>23</b>	<b>14</b>	<b>9</b>	<b>10</b>

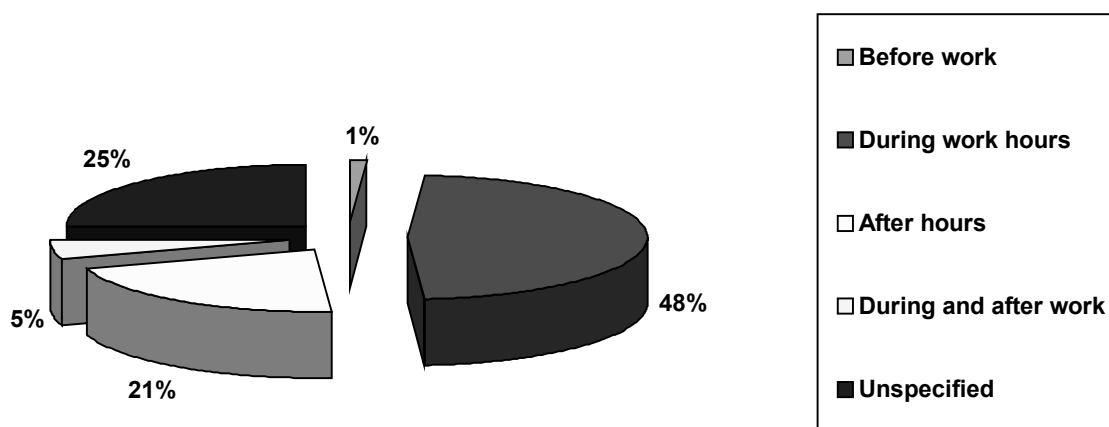
(c) Time of day when each activity was conducted

(i) Searching : The time of day when searching activities were conducted is presented in Table 4.10 and Figure 4.7 below. Nearly half of all searches (48%) were conducted in work time, 22% after hours, and 25% at unspecified times.

**Table 4.10 Time of day when searches were conducted (n and %).**

Time of day	Pre n= 102	Mar – Apr n= 79	May–Jun n= 57	Jul –Aug n= 47	Sep–Oct n= 40	Total Searches n (%)
<b>SEARCHING:</b>						
Before work	1 (1)	2 (2)	0 (0)	1 (2)	0 (0)	4 (1%)
During work hours	63 (64)	58 (49)	13 (23)	21 (41)	20 (56)	175 (48%)
After hours	6 (9)	32 (27)	17 (31)	7 (13)	13 (36)	75 (21%)
Both in and out of work hours	8 (8)	4 (3)	3 (5)	2 (4)	1 (2)	18 (5%)
Unspecified	21 (21)	23 (19)	23 (41)	21 (40)	2 (6)	90 (25%)
<b>TOTAL</b>	<b>99 (100)</b>	<b>119 (100)</b>	<b>56 (100)</b>	<b>52 (100)</b>	<b>36 (100)</b>	<b>362 (100)</b>

Note. 'Before work' = Before 8am. 'After hours' = after 5pm.  
'During work hours' = Between 8am and 5pm, Monday to Friday



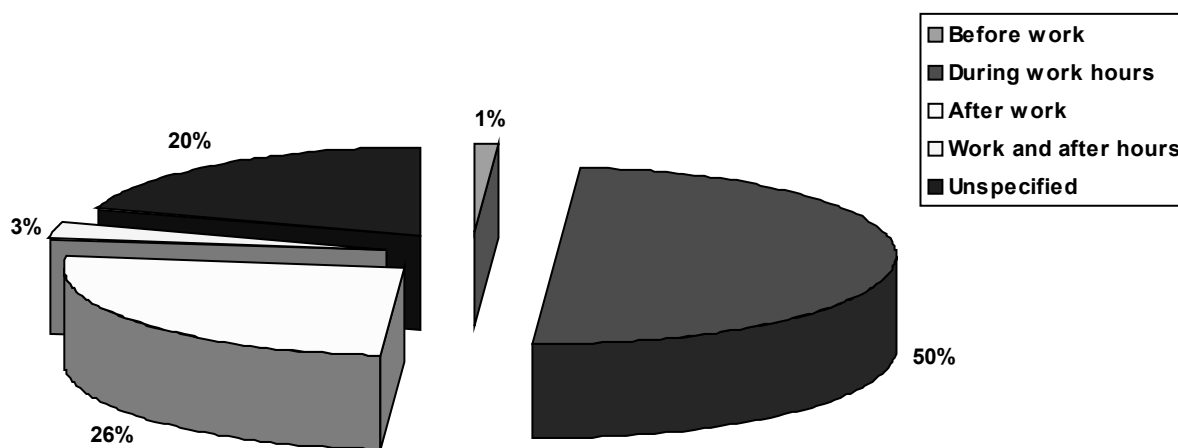
**Figure 4.7 Reported time of day (Searching)**

(ii) *Reading* : The time of day when reading activities were conducted is presented in Table 13 and Figure 8. Half of the reading activities were conducted during work hours, 26% after hours, and 3% during and after work. The time of day was unspecified for the remaining 20% of reported reading activities.

**Table 4.11 Time of day when reading was completed (n and %)**

<b>Time of day</b>	Pre n= 102	Mar–Apr n = 79	May–Jun n = 57	Jul–Aug n = 47	Sep–Oct n = 40	Total Reading n (%)
<b>READING:</b>						
Before work	0 (0)	0 (0)	1 (3)	0 (0)	0 (0)	1 (1)
During work hours	37 (69)	14 (41)	11 (32)	8 (73)	12 (38)	82 (50)
After work	4 (8)	10 (29)	13 (38)	2 (18)	13 (41)	42 (26)
Work & after hours	4 (8)	1 (3)	0 (0%)	0 (0)	1 (3)	6 (3)
Unspecified	8 (15)	9 (27)	9 (27)	1 (9)	6 (18)	33 (20)
<b>Total</b>	<b>53 (100)</b>	<b>34 (100)</b>	<b>34 (100)</b>	<b>11 (100)</b>	<b>32 (100)</b>	<b>164 (100)</b>

*Note.* 'Before work' = Before 8am. 'After hours' = after 5pm. 'During work hours' = Between 8am and 5pm, Monday to Friday



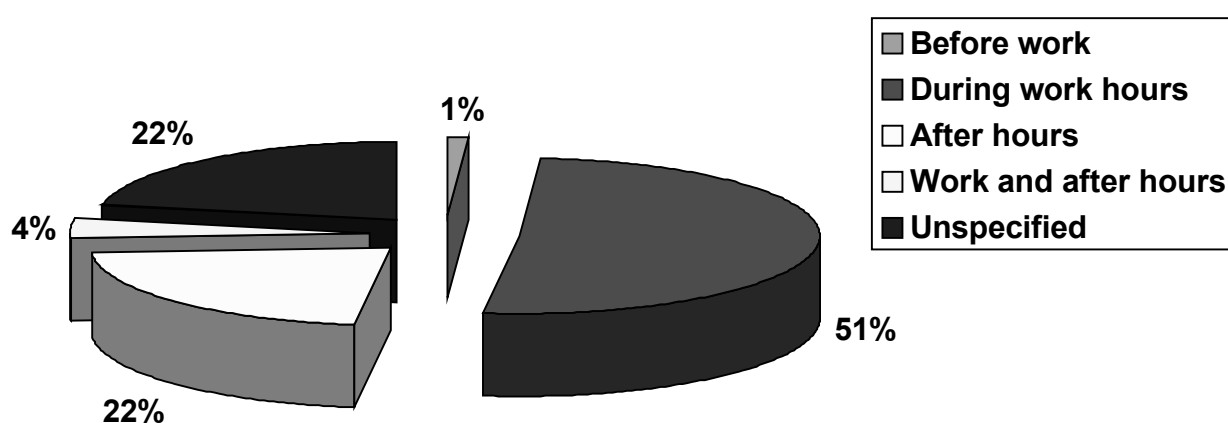
**Figure 4.8 Reported time of day (Reading)**

(iii) *Critical Appraisal* : The time of day when appraisal activities were conducted are presented in Table 14 and Figure 9. Approximately half (51%) of critical appraisal was conducted during work hours, 23% were after hours and 4% during work and after hours. The time of day was unspecified for the remaining 22% of reading activities

**Table 4. 12 Time of day when critical appraisal was conducted**

<b>Time of day</b>	Pre n = 102	Mar–Apr n = 79	May–Jun n = 57	Jul–Aug n = 47	Sep–Oct n = 40	Total Appraisal- n (%)
<b>APPRAISAL:</b>						
Before work	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)
During work hours	6 (43)	17 (71)	8 (42)	3 (27)	9 (53)	43 (51)
After hours	2 (14)	3 (13)	3 (16)	5 (46)	6 (35)	19 (22)
Both in and out of work hours	2 (14)	1 (4)	0 (0)	0 (0)	0 (0)	3 (4)
Unspecified	4 (29)	3 (12)	8 (42)	2 (18)	2 (12)	19 (22)
<b>Total</b>	<b>14 (100)</b>	<b>24 (100)</b>	<b>19 (100)</b>	<b>11 (100)</b>	<b>17 (100)</b>	<b>85 (100)</b>

*Note.* 'Before work' = Before 8am. 'After hours' = after 5pm. 'During work hours' = Between 8am and 5pm, Monday to Friday



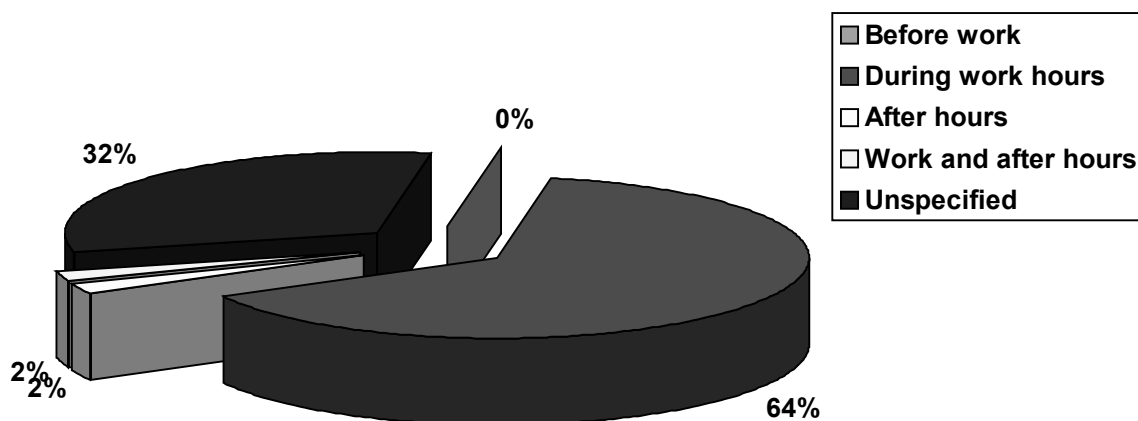
**Figure 4. 9 Reported time of day (Critical appraisal)**

(iv) *Teaching* : The time of day when teaching others about EBP was conducted (or teaching preparation conducted) is presented in Table 4.13 and Figure 4.10. Two thirds (64%) of teaching (including preparation for teaching) was conducted during work hours, 2% during work and after hours and 2% after hours. The time of day for the remaining 31% of reported reading activities was unspecified.

**Table 4.13 Time of day when teaching activities were conducted or prepared**

<b>Time of day</b>	Pre n = 102	Mar–Apr n = 79	May–Jun n = 57	Jul–Aug n = 47	Sep–Oct n = 40	Total Teaching
<b>TEACHING:</b>						
Before work	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
During work	5 (84)	21 (84)	5 (36)	0 (0)	1 (50)	32 (65)
After hours	0 (0)	0 (0)	0 (0)	0 (0)	1 (50)	1 (2)
Both in and out of work hours	0 (0)	0 (0)	0 (0)	1 (50)	0 (0)	1 (2)
Unspecified	1 (12)	4 (16)	9 (64)	1 (50)	0 (0)	15 (31)
<b>Total</b>	<b>6 (100)</b>	<b>25 (100)</b>	<b>14 (100)</b>	<b>2 (100)</b>	<b>2 (100)</b>	<b>49 (100)</b>

*Note.* ‘**Before work**’ = Before 8am. ‘**After hours**’ = after 5pm. ‘**During work hours**’ = Between 8am and 5pm, Monday to Friday



**Figure 4. 10 Reported time of day (Teaching others about EBP)**

## Critically Appraised Topics (CATs)

By February 2003, 12 months post intervention, a total of 23 participants had completed 15 critically appraised topics (most were completed in pairs). These summaries are now freely available at [www.otcats.com](http://www.otcats.com) in PDF format. The website was developed as part of the project and launched on the 1 May 2003. The site receives over 600 visitors each month (over 5000 in total over 12 months). New CATs have been completed by therapists from interstate, from the USA, and by 4th year undergraduate students at the University of Western Sydney. A sample CAT is presented in **Appendix 3**.

## Comparison of study completers and non-completers

Twenty-six participants did not complete the study, representing 23% of the original sample. Reasons for not completing the study included: conflict with work/family/study commitments (53%), workload (19%), ill health (12%), lack of time (8%), lack of management support (4%) and moving overseas (4%). Differences between participants that completed and did not complete the study were compared using data from the Survey 1 (pre-workshop). Differences of more than 10% in responses between the two groups are reported only. Raw data are presented in **Appendix 4**.

*Demographic Information.* The two groups were comparable with regard to level of initial occupational therapy qualification, postgraduate qualifications, enrolment in postgraduate study, employment status, geographical work location or primary work location. Non-completers were more likely to be between 5 and 10 years post graduation, and to work as a manager or consultant.

*Access to the Internet.* The two groups were comparable in relation to access to and use of the internet. Non-completers were more likely to have access to the internet at work than study completers.

*Perceived Barriers.* Study completers were more likely to report the following as barriers: difficulty accessing a computer, limited search skills and limited critical appraisal skills. The two groups were comparable for other perceived barriers.

*Attitudes.* Study non-completers were more likely to agree with the statement; '*the adoption of EBP places too many demands on me*' than those who completed the study.

*Self-reported skills & knowledge.* Results suggest that prior to the workshop, non-completers felt less able to conduct a computer search on their own, and were less aware of the range of electronic databases than those who completed the study. The two groups were comparable in other areas of skill and knowledge.

*Objective skills and knowledge.* Study completers were more likely than non-completers to know the correct answer (and to disagree with) the following statements, prior to attending the workshop: '*Databases such as Pubmed can only be accessed from hospital/university libraries*', and '*Single case designs are regarded as a similar level of evidence as RCTs*' than non completers. The two groups were comparable on all other test questions. Study completers performed slightly better on the Adapted Fresno Test of EBP than non completers (Mean score of 59 for study completers compared to a mean score of 50 for study non completers).

## Chapter Summary

A primary aim of this study was to measure changes in perceived barriers to EBP, skills, knowledge, attitudes and activity levels of 114 occupational therapists, in relation to their use of research evidence. This chapter has presented data on these five factors, including objective measures of performance, before and after a 2-day workshop on EBP, and in the 8 month follow-up period.

The number of perceived barriers changed as a result of the 2-day workshop. Not surprisingly, lack of time and high workloads continued as the primary barriers to adopting EBP. A perceived lack of skills in searching was the easiest barrier to overcome. A perceived lack of appraisal skills was more difficult to overcome, and took several months to change. Difficulty gaining access to the internet at work remained a barrier to EBP for approximately one quarter of the sample, at both the beginning and end of the study.

Changes in knowledge were immediate and sustained over time, both self-reported and when measured objectively.

Although there was a modest increase in activity levels immediately after the workshop, there was a steady decline in the proportion of participants engaging in each activity thereafter. A key finding was that activity levels were low initially and remained low.

There were no recorded events of participants implementing evidence or changing their practice with clients because of published research evidence. While this outcome was perhaps beyond the scope of the study, it was evident that the education and support provided did not change occupational therapy clinical practice, at least in the 8 months following the workshop.



## Chapter 5 BECOMING AN EVIDENCE-BASED PRACTITIONER<sup>14</sup>

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In addition to measuring change, this study also explored the process of becoming an evidence-based practitioner, and how common barriers were managed. This chapter reports findings from interviews with 10 participants, approximately 18 months after recruitment to the study. First, a typology of practitioners is described. Second, characteristics that defined each type or category of practitioner are presented. Third, the strategies used during the change process, to become an evidence-based practitioner are explored, followed by factors that helped or hindered change.

### A Typology of Practitioners

There were three distinct categories of participants, according to their level of engagement in the process of EBP. These categories were: *Novices*, *Apprentices*, and *Competent Non-Experts*. It was difficult to choose an appropriate label to represent the latter group because none could be classified as experts in EBP. Instead, the term '*Competent Non-Expert*' was chosen to reflect their enhanced skills and knowledge, and increased proficiency at activities such as searching and critical appraisal. The three categories existed on a continuum, ranging from those who mostly operated as experience-based practitioners (the *Novices*), to those who were more evidence-based in the way they thought and worked (the *Competent Non-Experts*). The three categories of occupational therapists were defined according to the presence or absence of certain characteristics, and the use or non-use of certain strategies.

### Characteristics of Practitioners

Participants could be categorised according to their level of *skill*, *knowledge*, the *frequency of behaviours*, and their *attitude* to EBP (see Table 5.1). *Novices* possessed rudimentary skills, limited knowledge, rarely engaged in search and appraisal activities, and displayed a somewhat negative, pessimistic attitude to EBP.

**Table 5.1. Categories and Characteristics of Practitioners<sup>15</sup>**

CHARACTERISTIC	CATEGORIES		
	Novices	Apprentices	Competent Non-Experts
Skills	Rudimentary	Developing	Competent
Knowledge	Limited	Developing	Extensive
Behaviour Frequency	Rare	Irregular	Regular
Attitude	Pessimistic	More optimistic	Optimistic

<sup>14</sup> Acknowledgment: The content of this chapter was developed jointly in 2003 with Lauren Thompson and Sally Home, for their final year honours theses at UWS.

<sup>15</sup> Format adapted from Bonner, 2001.

Conversely, *Competent Non-Experts* had achieved skill competency, possessed extensive knowledge, engaged in search and appraisal activities regularly, and displayed a positive, optimistic attitude to EBP. *Apprentices* were somewhere in between.

### Strategies used

Three key strategies were used more often and more consistently by *Competent Non-Experts*, than by other participants. These strategies, presented below in Table 5.2, were: 1) *Finding Time for EBP*; 2) *Developing Skills and Knowledge*; and 3) *Staying Focussed*.

**Table 5.2 Strategies used to become an evidence-based practitioner**

Strategies	Sub-Categories
1). <b>Finding Time for EBP</b>	<ul style="list-style-type: none"> <li>• Prioritising Activities</li> <li>• Planning Ahead</li> </ul>
2). <b>Developing Skills and Knowledge</b>	<ul style="list-style-type: none"> <li>• Using Evidence</li> <li>• Teaching EBP to Others</li> <li>• Seeking Help</li> </ul>
3). <b>Staying Focussed</b>	<ul style="list-style-type: none"> <li>• Making a Commitment</li> <li>• Being Persistent</li> <li>• Being Motivated</li> </ul>

(1) *Finding time for EBP* involved *prioritising* activities and *planning* ahead. Time was in short supply and was the major barrier to engaging in EBP for all participants, as indicated by the following quote:

*I'm sure everyone finds time a big issue. It is very difficult. Clinically, with just seeing the clients here, it's very busy. And then there are always loads of additional projects that we're working on, meetings and supervision. So, definitely it is very difficult to find the time (OT9)*

In order to find time, *Competent Non-Experts* made research utilisation a priority. They negotiated time, and set time aside in and out of work hours for EBP-related activities. Conversely, *Novices* complained about lack of time and did not implement these strategies. A few *Novices* tried to set aside time but were not persistent in maintaining this commitment, partly because they and their organisation did not place a high value on EBP-related activities:

*Here, if it doesn't get...a little old lady out the door and back home, well then [it is not considered important] (OT6).*

Searching, reading and critical appraisal were not considered an essential part of the day-to-day work of an occupational therapist by *Novices* or their organisations. Nor were these activities valued in comparison to clinical ‘hands-on’ work, resulting in participants feeling guilty when they engaged in EBP-related activities at work:

*I found that every month I either had to book over that time for clinical appointments to meet the caseload demands...so that was interesting in itself, my own attitude ...rather than protecting that time and doing evidence-based work, I kept putting it off (OT4)*

Private practitioners were concerned about their billable time, and about the cost and time effectiveness of using evidence, particularly if they could not charge their time to a client. They prioritised billable work hours ahead of searching or appraisal, but commonly developed a network for sharing resources, and more often than not, completed their EBP-related activities outside of work hours.

Several participants recognised that EBP *had* to become part of their routine work for it to be sustainable, with a certain number of hours being allocated per week or month: *we’ve got to change our cultures and job descriptions...to include the time...rather than it being something you can tack on when you’ve got a free moment.* Such policies were already in place for some participants. *Competent Non-Experts* planned ahead by booking blocks of time in their diary:

*I have autonomy over my work practices and was able to book in ...big chunks of time...I just booked ahead...I just planned and booked out my diary (OT7)*

In summary, ***Finding time for EBP*** was difficult for all participants. Lack of time was the major barrier to adopting EBP. While *Novices* struggled to prioritise and plan, *Competent Non-Experts* managed their time by prioritising research related work ahead of other tasks, and scheduling time in advance in their diary. Thus, effective time management appears to be a core characteristic of an evidence-based practitioner.

**(2) *Developing skills and knowledge*** was the second strategy used by participants to become more evidence-based, and involved *using evidence, teaching EBP to others, and seeking help* when faced with difficulties. Lack of skills and knowledge was a barrier to using evidence for nine of the 10 participants. Completing critical appraisals and understanding statistics in papers were the major tasks with which many struggled. However, *Competent Non-Experts* were able to competently engage in the first three stages of the EBP process at the time of interview, and had overcome many difficulties by persisting, practicing and seeking help. The following quote reflects one participant’s recognition of the importance of practice and using her newly acquired skills:

*...The penny eventually dropped then, which was purely about allowing myself time to do that [EBP]. Makes sense doesn’t it? If you allow yourself time to do something, you’ll get better at it. ...The penny started to drop - that with more practice [my skills and knowledge increased]. (OT4)*

Five of the 10 participating occupational therapists were actively involved in journal clubs or similar research-focussed activities at work, which required them to use their skills and knowledge regularly:

*[We] started the new journal club about a year ago...everyone has a group that [they're] in. We meet once a month and pick a topic, and then everyone has a certain task to do in terms of doing the searches, or reading the articles or writing the summary (OT1)*

*Competent Non-Experts* were more likely than *Novices* or *Apprentices* to be involved in such activities. This involvement was partly due to organisational expectations, and a habit of routinely questioning work practices. These participants were motivated to find and use best evidence in order to provide the best practice to their clients. Although half of the participants hoped to change their practice in some way based on research evidence, none of the *Competent Non-Experts* were at the stage of considering published evidence routinely in clinical decision-making.

*Novices* were more likely to maintain the status quo than *Competent Non-Experts*. *Novices* were caught in a vicious circle of not being able or willing to develop their skills because of barriers such as not being able to search effectively. They felt unable to overcome such deficits and instead continued to rely on old habits and experience:

*People rely on their experience more than [they] rely on the research...there's not a great culture of trying to be very clinically objective. It's more about what we've learnt in the past...and putting that into practice than about continually searching for the best methods (OT8).*

Teaching EBP to others helped the *Competent Non-Experts* consolidate and practice their new skills, and develop confidence in their ability to use evidence: *it was good doing the in-service...you often learn something better and practice it more than if you're just reading it.* They were expected to educate others in the organisation about EBP, and about searching and appraisal: *it was very much pushed that we had the responsibility to educate [others].* However, *Novices* did not encounter the same expectations, and were less likely to feel they had the skills to educate others.

The role of local opinion leader was one that *Competent Non-Experts* often adopted upon their return to work: *[I was] dubbed in to be the evidence-based champion.* They provided in-services at work for other staff, and established journal clubs.

The third way in which participants developed their skills and knowledge was by actively seeking help from others, in person or by phone or email. This help sometimes involved a demonstration of searching techniques from a buddy or mentor, or obtaining expert advice about the interpretation of statistics. Librarians were a common source of help and support. Work could be delegated to a librarian in some organisations *to save a bit of time in the process...I develop the clinical question and mail it down to the librarian. She'll do the search for me and send up the result.*

A buddy was someone who worked with participants on their evidence summary, as part of the assignment for the research project. A buddy helped maintain motivation, shared the work, and sometimes supplied journal articles:

*I think the buddy system ...worked really well, with everyone being motivated ... to share out the jobs a little bit, bounce ideas off each other and motivate each other. To also remind each other when deadlines were coming up and that sort of thing. I think that's a great system and it helps you to network a little bit too (OT9).*

Three participants worked with a buddy. Those who did not use a buddy (because of distance, lack of agreement on the topic, or work changes) felt this to be a major barrier. Those without a buddy felt isolated and at a loss when trying to overcome skill deficits. However, participants also located and used other experts, such as the project outreach support person, who conducted support visits, answered email enquiries and helped with searching over the telephone.

In summary, *Competent Non-Experts* in this study developed skills and knowledge through using evidence in practice more often than others, by *teaching EBP to others*, and by *seeking help* in times of difficulty.

**(3) *Staying focussed*** was the third strategy used by participants. This strategy involved *making a commitment* to EBP, *being persistent* when barriers were encountered, and *being motivated* about EBP. This strategy involved changing work habits and maintaining these changes over time in spite of the many distractions. Staying focussed did not mean there was constant activity. The *Competent Non-Experts*, who managed to stay focussed, worked in peaks and troughs. They had periods of continuous activity followed by periods of inactivity. However, despite periods of inactivity and barriers encountered along the way, they did not lose sight of their short term and long-term goals. The first step was *making a commitment*.

*Making a commitment* meant committing oneself to completing activities such as searching and appraisal, because there was an expectation, personally or from the organisation that a summary of evidence would be completed within 8 months. *Making a commitment* also implied that using evidence was valued.

*I suppose I had...this obligation, having been part of the project...You signed up, and you knew what you were in for. So we needed to finish it. But that was probably a self-imposed obligation, because all along, we were aware we could drop out (OT10)*

The attitude of *Novices* was positive at the end of the 2-day workshop, but waned over time. Their commitment was more likely to waiver over time when faced with barriers such as lack of time or limited success when searching or writing a clinical question: *just lack of commitment, I suppose, to put in the time when I didn't feel that I could do... a great deal in work time.*

*Being persistent* involved hard work, and continuing an activity despite failure or obstacles. It was easier to persist if participants were motivated, committed to using evidence, and had organisational support. *Being motivated* meant keeping going, having a desire or drive to finish their summary of evidence, and apply evidence in practice. Many were motivated by a desire to stay up-to-date. All had been motivated initially to participate in the study, and attend the 2-day workshop: *I did the 2-day workshop and came back very motivated and very keen ... and did quite a lot of work into my question.* However, as time progressed and deadlines advanced, motivation diminished for most participants. Lack of motivation was characterised by long periods of inactivity and limited time spent searching or appraising evidence, and therefore, limited time spent developing or practicing skills.

*Competent Non-Experts* reported being motivated to continue using evidence because of comments made by work colleagues, friends, and managers, and by emails sent from the

outreach support person. They were also motivated by meeting deadlines for the project, such as completing and then presenting their summary of evidence to others at a one-day conference. One *Competent Non-Expert* stayed focussed because her manager showed great interest in the project, and kept asking for email updates on her progress and summary of evidence. In summary, *Competent Non-Experts* stayed focussed on becoming an evidence-based practitioner by *making a commitment, being persistent, and being motivated*.

### Influencing Conditions

There were several factors or conditions that helped participants to change and adopt EBP, or conversely, that limited their progress and acted as additional barriers. These factors were: *readiness for change*; personal and organisational *expectations*; the *presence of deadlines*; and the *availability of support*. If these conditions were present and positive, participants were more likely to progress. If these conditions were absent or negative, they hindered progress and acted as barriers to change.

**Table 5.3**                      **Conditions that influenced change and the uptake of EBP**

Conditions	Definition
<b>Readiness for change</b>	Time ready, intellectually ready, resource ready, or skill ready. Readiness to change work habits and allocate time to EBP-related activities.
<b>Personal and organisational expectations</b>	Personal expectations of achievement. Use of evidence encouraged and expected by individuals and their organisation. Managers and supervisors were enquiring and interested, and expected new knowledge to be applied and shared with others in the organisation.
<b>Presence of Deadlines</b>	Intrinsic or extrinsic, negotiable or non-negotiable, urgent or non-urgent. The presence of deadlines helped initiate and stimulate further activity levels; provided direction and focus for participants.
<b>Availability of support</b>	Encouragement, physical resources (internet, journals, computer, databases) financial assistance and work concessions. Support from managers, organisations, buddies and peers.

The categories of practitioner, strategies used and influencing conditions form a provisional model of change, from experience-based practice to evidence-based practice. A profile of *Novices*, *Apprentices* and *Competent Non-Experts* are presented below.

### Novices

Two participants were classified as *Novices*, and were in the early stages of change. They had difficulty with the first two stages of the EBP process (writing a clinical question and searching for evidence) and even 18 months after the workshop, had not begun to appraise literature: *I still don't ... critique a journal article. I know I should but I don't (OT8)..*

*Novices* could be recognised by their limited skills and knowledge, and limited use of EBP-related terminology. For example, one participant referred to 'random control

trials' instead of 'randomised controlled trials'. They had limited knowledge of EBP jargon, did not use technical language, misused terminology or were unable to remember appropriate terms. In place of using technical terms, they used words like 'stuff' and 'things': *I didn't have enough computer skills...to know anything about search engines or how to go about finding stuff (OT5)*

Novices rarely used their skills in practice, gave up easily, and did not persist when faced with difficulties. Their limited internet and computer skills proved to be a barrier to progress when seeking evidence:

*I'm still not all that practiced and skilled at doing it (putting a clinical question together (OT5)*

*I then did try to do a search relating to a client and wasn't able – wasn't successful in the search (OT8)*

They wrote clinical questions, and engaged in some searching but did not appraise or use research evidence. They would collect articles, perhaps read them but did not engage in appraisal: *I read it. That's about it. Novices did not apply the EBP process often: I don't necessarily use specific clinical questions....I try and look at target words, I guess...[but] it's not day to day.*

Novices tended to have a pessimistic outlook to achieving EBP compared to other participants. They focussed on barriers rather than on how to overcome them. They tended to be rather flippant about the importance of EBP, using phrases such as 'playing around', 'to-ing and fro-ing' and 'trying' which implied less commitment to EBP than that shown by other participants.

## **Apprentices**

*Apprentices* existed between the *Novices* and *Competent Non-Experts*, on a continuum ranging from experience-based practice to evidence-based practice. *Apprentices* possessed detailed and accurate knowledge of the EBP process and the activities they should be undertaking. They were, however, still in the process of developing and refining their skills, and becoming more proficient. They could write a clinical question, search for information with little difficulty and were beginning to use available resources to appraise the evidence located:

*I have the skills now to look something up... it feels good to be able to just type something in and 'Right – great - I've got what I need'. And I know how to get what I need (OT2).*

When an *Apprentice* hit a barrier along the way, they temporarily 'shelved' the task. However, unlike *Novices* they would always return to and try to master the task. Their level of enthusiasm and confidence varied in accordance with the degree of difficulty experienced, particularly when faced with the challenge of interpreting statistics:

*I started a new question...did all the searches...got all the articles...read them all...started the summary and then got stuck on the stats...I've done the summary of what they actually did, but it's come to actually analysing the stats and trying to compare all the different results that they got. And that's the bit I got stuck on (OT1)*

*Apprentices* also recognised that they needed to get help when faced with barriers. They used resources, such as statistical textbooks and the outreach support officer. They were aware that they should be trying to implement research evidence in practice, and although some were trying to do so, most found implementation a major challenge:

*The final stages of the process...implementing change...I'm not very good at it, I know that much (OT1)*

This group of participants realised that they needed to be doing more than simply reading research. They knew that they should be analysing and applying this information, but continued to experience difficulties interpreting statistical concepts during appraisal. They had a greater knowledge of technical language and terminology related to EBP than *Novices*. For example, *Apprentices* used terms like 'levels of evidence', 'clinically effective', 'randomised controlled trials' and 'critical appraisal'

The primary behavioural indicator of *Apprentices* was that they had moved beyond searching and reading. They were employing steps in the EBP process including appraisal more often than *Novices*, and had identified other questions they might answer. Some of the *Apprentices* had written new clinical questions and conducted new searches, which the *Novices* had not done. However, *Apprentices* were still not using evidence regularly in practice.

In terms of attitude, *Apprentices* were positive about using evidence in practice, and, like all participants, were keen to keep learning and stay up-to-date. They were not driven by internal motivation like the *Competent Non-Experts*, and tended to respond more to external deadlines such as a visit by the outreach support person. As a consequence, they experienced long periods of inactivity, often for weeks and months. They worked inconsistently, and stopped and started depending on prompts from external sources:

*After that, I went through another lapse, and then it was time for the summary of evidence to be due. And it was like "Oh my God...I've got to get this done". (OT2)*

### **Competent Non-Experts**

The third category of practitioner was the *Competent Non-Expert*. They possessed extensive knowledge, advanced skills and were very active in using their knowledge and skills frequently. These practitioners were proficient in using databases and the internet to locate articles. They used EBP jargon appropriately and comfortably, such as 'systematic reviews', 'levels of evidence'; 'PICO' and 'confidence intervals'. They mentioned barriers less often than *Novices* and *Apprentices*, and were using the key strategies to help adopt EBP.

They were active in their departments and organisations, and encouraged other occupational therapists to increase their use of evidence. They were local opinion leaders, and champions of the EBP movement. They adopted the roles of educator and leader, were involved in changing and writing departmental policies and procedures. *Competent Non-Experts* thought about and revised the content of their departments business plan, which none of the other participants did. These participants typically came from supportive organisations, in terms of both management and peers. Their



managers provided visible and active support, encouragement and clearly expected the new skills and knowledge to be used.

*Competent Non-Experts* regularly conducted activities involving the use of evidence. They planned and spoke of a future for themselves that included EBP. They were writing new questions, which they hoped to answer. They had begun to use findings from their searches to update local clinical practice guidelines and policies.

*I now use the McMaster appraisal tool...and...make a recommendation to the organisation whether or not to take on board anything about new practice depending on the level of evidence provided (OT7)*

Finally, the *Competent Non-Experts* were positive and optimistic about being able to adopt EBP, rarely talked about and typically managed barriers that other participants spoke about at length.

## **Chapter Summary**

This chapter has presented three categories of practitioner according to their adoption of EBP, strategies used (or not used), and factors that helped or hindered their progress towards becoming an evidence-based practitioner.

Lack of time was identified as a primary barrier to change. Overcoming this barrier involved ***finding time for EBP*** using strategies such as *prioritising* and *planning ahead*. Limited skills and knowledge were overcome by *using evidence*, *teaching others* and *seeking help*. Participants needed to ***stay focussed*** to achieve their long-term and short-term goals by *making a commitment*, *being persistent* and *being motivated*. Participants moved forwards if certain conditions were present. These conditions were: *readiness for change*, *personal and organisational expectations*, *the presence of deadlines* and *support*. The consequence of using these strategies, and having certain conditions present was that participants moved beyond talking about barriers, and moved closer to being an evidence-based practitioner.

## **Chapter 6**      **DISCUSSION**

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This study investigated whether a 2-day workshop on EBP and outreach support resulted in changed attitudes to EBP, increased skills and knowledge, and altered work behaviours of a group of Australian occupational therapists. A second phase of the study explored the process of change, and participants' experiences of becoming an evidence-based practitioner.

The following chapter will present a discussion of the sample, study design, change over time, and factors that influenced change. Furthermore, implications and recommendations will be made for the occupational therapy profession, particularly for research, education and practice.

### **The Sample**

The study sample was demographically representative of occupational therapists across NSW with over two-thirds working full-time in the Sydney metropolitan area (OT Australia NSW, 2003). Equal proportions of participants worked in the public and private sector, also consistent with OT Australia NSW membership statistics at the time of data collection. However, occupational therapists in the study had chosen to participate. The self-selected sample needs to be considered when interpreting results.

### **Study Design**

When planning the study in 2001, consideration was given to randomising participants to intervention and control groups. This design would have allocated half the sample to receive education on EBP and outreach support, and half the sample to receive no education or support. All would have been recruited and asked to complete surveys on three occasions.

A randomised controlled trial was not instituted for two reasons. First, those expressing interest were already keen to learn about EBP, and if allocated to a control group, may have pursued an alternative form of EBP education. Thus, they would have been a biased sample. It would have been difficult to recruit a sample of participants who were *not* interested in EBP, and expect them to complete three surveys over a year. Second, funding was limited, and mailing surveys out to a sample of 230 participants instead of 114 would have increased costs in an already biased study. Therefore, the decision to use a 'before and after' study design for phase 1 was a balance of many factors.

### **Format of the EBP Workshop**

The educational intervention was provided over two days, partly to accommodate the needs of rural therapists who often spent a whole day travelling to Sydney, and another day returning home. In retrospect, half day or single day workshops, separated by a few weeks would have been preferable, as participants found the second day on critical appraisal and interpreting statistics contributed to cognitive overload. However, a split format was not feasible because of the distances many participants had to travel. Furthermore, asking participants to return for a second workshop would have increased demands on the sample, resulting in more dropouts.

Shorter 3-hour modules have been trialled by OT-Australia NSW during 2003 and 2004. Topics included: an introduction to EBP; writing a focussed clinical question; searching databases; critical appraisal of randomised controlled trials; critical appraisal of qualitative research; interpreting statistics; and critical appraisal of tests, outcome measures and assessments. Unfortunately, sessions were attended by only five or six members (total membership of approximately 1000), or had to be cancelled because of even smaller numbers. Self-directed, flexible learning, and distance learning modules are other alternatives that could be used, although these formats do not suit all learning styles.

The 2-day format is recommended for future studies in Australia, given the distances participants would need to travel to attend a workshop. Alternatively, distance learning packages, involving the internet and email communication could be used and evaluated.

## **Outreach Support**

This study is one of the first to provide outreach support to allied health professionals who were learning about EBP and endeavouring to change their practice. Earlier studies have typically provided outreach support visits, feedback and reminders to general practitioners with the intention of changing prescribing practice behaviour (Thompson O'Brien et al, 2000) rather than search and appraisal practice behaviour. In the current study, outreach support was provided via email, phone and through one face-to-face visit. However, after survey two had been completed (post-workshop), it was not possible to separate the effect of outreach support on behaviour from the effect of the 2-day workshop. Thus the findings should be considered exploratory.

For many participants, a personal visit from the outreach officer acted as a catalyst, a motivator and a prompt to re-engage in EBP. This finding emerged strongly in the interviews. However, not everyone in the study needed or wanted an outreach support visit, particularly the *Competent Non-Experts* and *Apprentices*, who had already found their own supports and mentors. Sometimes a 'buddy' with whom participants had paired up acted as a primary support, performing a similar role and function to the outreach officer. When designing the study, it had been hoped that such arrangements would evolve, since these supports exist beyond the life of the project.

Outreach support visits were expensive in terms of time, travel and accommodation costs, particularly outside the metropolitan area. In reality, much of the support was provided by telephone, before and after visits. The outreach officer conducted many guided searches with participants by telephone, while both used their respective computers in different locations. This is not always possible, however, if participants have only one telephone line for their home office, and cannot use the internet at the same time as the telephone. Broadband internet access overcomes this problem, in addition to making searching faster.

It is recommended in future studies and during education programs that outreach support, if provided, be offered by telephone and email without face-to-face visits. Telephone and email support is less expensive than visiting participants. This mode is also more practical in a country with large distances, and with rural and remote therapists who need to keep up to date. Furthermore, those participants who advanced their skills and knowledge, became EBP 'champions' and were moving beyond

searching and appraisal were motivated by factors other than the outreach support. These other factors included their readiness for change, having high personal and organisational expectations that EBP would be part of their ongoing work, the presence of deadlines, and a network of support that they themselves established.

## **Time Management and EBP**

Consistent with previous literature in occupational therapy and allied health, a lack of time and large workloads remained the most frequently reported barriers to adopting EBP, followed by lack of skills and knowledge (Bennett et al., 2003; McCluskey, 2003).

The increase in participants reporting lack of time as a barrier immediately after the workshop (an increase from 75% to 94%) suggests that participants recognised and accepted two facts. First, they probably recognised that change and the uptake of EBP would involve dedicated time for skill development. Second, this increase suggests awareness that a change in priorities would be needed on a long-term basis. Both hypotheses are supported by the behaviour of participants over subsequent months. *Finding time for EBP* and *developing skills and knowledge* related to EBP were necessary strategies for change. Effective time management emerged as an important strategy as well as a necessary condition for involvement in EBP.

Consistent with the current study findings, time management literature suggests that improving time use requires commitment, and that change is more likely if a person persists and is ready for change (Davis, 2003). Strategies for better time use include: prioritising daily tasks (Rogak, 1999), making plans (Dobbins & Pettman, 1998), delegating tasks to allow time for more important activities (Mancini, 1994), setting aside blocks of time (Dobbins & Pettman, 1998) and dividing large overwhelming tasks into smaller sections so they appear more manageable (Kroehnert, 1999). Other strategies suggested in the literature include not postponing tasks (Mackenzie, 1997) and maintaining a time management schedule (Rogak, 1999). These strategies are consistent with those adopted by study participants. Strategies adopted by participants were *prioritising activities* and *planning ahead*. *Competent Non-Experts* discussed how they managed tasks in small segments to avoid feeling overwhelmed. One participant delegated tasks to a librarian. Others talked about booking blocks of time in their diary.

The concept lack of time implies that time needs to be ‘found’, and participants commonly spoke about *finding time*. However, time as a concept is limited. There are only 24 hours in a day. Findings from this study suggest a need to recognise that the hours in a day, time for seeking and reading evidence, and large workloads will not change. Perhaps the concept of “finding time” needs to change from that traditionally reported in the literature. A new conceptual way of looking at time is required. The problem is not so much a lack of time but rather the allocation and prioritisation of time. Emphasis in undergraduate and graduate education needs to change, with a reprioritisation of work values and routines. Only then will time spent seeing patients and writing reports be considered equally important to reading, appraising, thinking and changing what is done in practice. The following quote from a novice in the study reflects the attitudes that were pervasive in many organisations, and which hamper any change by individuals towards evidence-based practice:

*... if you're trying to read a journal article, you have to have a report that you're writing, to slip over the top so that if anyone comes in and sees you, you can pretend you're doing that [writing the report]. Because it's ... frowned upon, to be doing that sort of thing [reading a journal article in work time].*

Attitudes and values such as these were barriers that could not easily be overcome by an individual, but were pivotal to practitioners involvement in EBP. A change in the way that time is valued and spent in most organisations will depend largely on forward thinking managers and supervisors.

Time wasting activities are also identified in the literature, and include procrastination (McGuire, 2003), lack of self-discipline (Mackenzie, 1997), inadequate planning (Mackenzie, 1997), not understanding the task (Kroehnert, 1999), being reactive rather than proactive (Dobbins & Pettman, 1998), not setting priorities and poor delegation (Dobbins & Pettman, 1998). Participants in this study engaged in some of these time wasting activities. They procrastinated and delayed starting the project. They engaged in 'busy' work such as searching and collecting information for longer than was needed. This delay may have been due to poor search techniques or not fully understanding the time involved in completing the critical appraisal task. Participants may have also been spending time searching to delay the critical appraisal stage due to concerns regarding lack of skills. Participants also tended to be more reactive rather than proactive. *Novices* tended to be more reactive in managing time. They focussed on problems and appeared to believe they had no control over the process (Covey, 1999). *Competent Non-Experts* were more likely to be proactive, positive and believe they were in control than *Novices*. This proactive management of 'self' led *Competent Non Experts* to find time for activities involving the use of evidence.

Overall, this study highlights a need for education on time management when graduates and undergraduates are learning about EBP. Better time management skills were also identified as a priority by the majority of occupational therapy students at the University of Western Sydney in 2003, who participated in a final year professional development subject. Many focussed on time management as one of their three learning objectives when given free choice with their study topic. A journal article on time management, research-utilisation and EBP may also help to address this international, cross disciplinary challenge.

## **Developing Skills and Knowledge for EBP : 'Use it or lose it'**

Developing skills and knowledge for EBP is an ongoing process (Rosenberg, Deeks, Lusher, Snowball, Dooley & Sackett, 1998). The knowledge and skills required to become an evidence-based practitioner include learning about the five steps of EBP (Rosenberg & Donald, 1995; Sackett et al., 2000). At the initial stage, skills are acquired so that a clinical question can be written. Most of the participants in the study indicated that they were able to write a question. However, *Novices* still demonstrated more difficulty with this initial stage.

**Database searching skills:** Following this first step, database search skills were developed. This proved to be an ongoing challenge for several participants who continued to engage in 'busy' work, searching for and collecting more articles rather than refining their search skills. This finding further highlights the need for support,

particularly local support, for health professionals who are learning to refine their searching skills.

**Critical appraisal skills:** Critical appraisal is the next stage in the process of EBP. Limited appraisal skills were a barrier to implementing EBP for most participants in the study, as previous studies had already noted (Bryar et al., 2003; Curtin & Jaramajovic, 2001; McCluskey, 2003; Oswald & Bateman, 2000). Even at eight months after education had been provided in the current study, 42% of participants still reported limited appraisal skills as a barrier to adopting EBP. Furthermore, nine of the 10 participants interviewed 18 months post-intervention still found aspects of critical appraisal difficult, with over half commenting that they had difficulty interpreting statistics.

These data indicate that developing appraisal skills and interpreting statistics remain a major challenge for allied health professionals. These skills were not as easy to overcome as learning how to search. This new knowledge about the challenge of critical appraisal can inform undergraduate educators and those running in-services and workshops for practitioners. Educators may need to provide greater amounts of time explaining and practising critical appraisal. The difficulties with critical appraisal can also be addressed by managers, through their active support and attendance at journal clubs and interactive workshops on EBP. Local opinion leaders also need to be supported and encouraged to act as role models for other staff members. Outreach support services could also be purchased for a fee in private sector organisations, from 'expert' evidence-based practitioners.

**Applying evidence in practice:** The last two stages of evidence-based practice involve applying findings to practice and evaluating the results. These two stages were not reached by most participants, but were also beyond the scope and goals of this study. The research study and 2-day workshop focused on completion of the process of EBP *up to* the stage of critical appraisal. However, approximately half of the participants indicated that were endeavouring to make changes in their clinical practice based on research evidence.

Strategies used by *Competent Non-Experts* in this study to develop skills and knowledge included *using EBP, teaching EBP to others, and seeking help*. Previous studies have suggested that once skills and knowledge have been acquired, time needed to complete specialised activities such as searching databases will decrease as practitioners become more efficient (Bennett et al., 2003). However, skill development and progression requires regular practice. Several participants indicated that they spent only limited time practicing how to find or appraise research, because of other work priorities. Limited time spent using research evidence had a negative effect on skill development.

Lack of skills and knowledge were easier to address than lack of time. Training and workshop education did help to measurably improve skills and knowledge, although this did not always translate into *use* of skills and knowledge in the workplace. The continued improvement from post workshop to follow up – a period of 8 months - suggests that outreach support may have had some impact on skill and knowledge levels, or more likely, that progression of skills and knowledge occurred as a result of practice.

## Frequency of Searching, Reading and Critical Appraisal

Frequency of engagement in searching, reading and critical appraisal was low in the current study. Indeed the level of activity decreased over time, instead of increasing as was expected.

**Searching frequency:** Approximately one quarter of participants performed one search over 8 weeks (range 10% to 30%), using original databases such as Medline and CINAHL and secondary sources such as OTseeker and PEDro. This frequency equates to about 6 searches per year. The majority did no searching over an 8-week period (between 30% and 62% of the sample, depending on the time post-workshop).

A recent study by Jette and colleagues (2003) surveyed 1000 physiotherapists in the US about research utilisation, including searching frequency. In that study, the majority (65%) reported performing ' $\leq 1$ ' search per month (some performed one search, some performed none). These data from the US included participants who did no searching, and may over-estimate searching frequency because of retrospective, rather than prospective, self-reporting. Nonetheless, this US study involved a large sample and was conducted recently, allowing some comparisons to be made. While nearly two thirds of these US therapists reported searching once a month (which equate to about 12 times a year), the majority of current study participants did no searching.

**Reading frequency:** Less than one quarter of the current sample engaged in any reading (one article over an 8-week period or 6 articles per year - see Table 4.8, page 25). This proportion is lower than Jette and colleagues reported, with 17% of their respondents claiming to have read ' $\leq 1$ ' article per month (equal to about 12 articles per year).

Less than once quarter of the current sample read between 2 and 5 articles over an 8-week period, which equates to between 12 and 30 articles per year. This is a much healthier reading frequency for anyone claiming to be 'evidence-based', but still less than that reported by Jette and colleagues (2003). In their study, two thirds (66%) of US therapists reported reading between 2 and 5 papers per month (between 24 and 60 papers per year).

Most of the current study participants read no research articles over 8 weeks (range 60.0% to 83.0% of the responding sample). This was a surprising finding. The implication is that nearly two thirds to three quarters of occupational therapists in this study were not keeping up-to-date, if one research article over eight weeks (six research articles over a year) is accepted as the minimum for 'keeping up to date'.

These findings are very different to the findings of Domholdt, Flaherty and Phillips (1994) who collected data on the reading habits of four expert physiotherapy researchers (who regularly reviewed research for journals) and 20 inexperienced physiotherapy researchers (clinicians). In the novice group, 14 of the 20 participants (70%) reported reading fewer than five 'journal articles' per month, and six novices (30%) reported reading five or more 'journal articles' per month (equivalent data were not provided for the expert group). A key finding of that study was that frequency of reading did not affect the critical appraisal skills of participants. That is, more regular readers were no better or worse at critical appraisal than those with less regular reading habits, implying that professionals need to read with a purpose, using a checklist or guide. However, the latter group asked respondents to estimate their own reading frequency, which may have contributed to a more favourable and higher figure (70% said they were reading five or

more articles per month = 10 or more over 8 weeks). They also had a smaller sample (n=20). In the current study, participants kept prospective records which are likely to provide a more accurate record than retrospective estimates.

In the current study, an even smaller proportion of participants engaged in critical appraisal compared to simply reading a paper. For example, in the May/ June 2002 time period, 10 of the 57 responding participants (17.5%) had engaged in reading 'at least once' in 8 weeks (articles or books related to EBP or research); whereas only 5 of the 57 (8.8%) had engaged in critical appraisal 'at least once'. What is required, as Jeanne Tyrrell suggested, is a middle ground:

*'...[It] is unacceptable for therapists to boast about copies of [their professional journal] languishing unread in their wrappers for months. However, it is equally irritating to encounter the over-zealous idealist who berates busy clinicians for failing to conduct daily literature searches on Medline or CINAHL so that their practice is up to date and evidence based. There is a middle ground between literary apathy and unbridled bibliophagy' (Tyrrell, 2000, p. 49).*

Results of this study suggest that some organisations will need to introduce a regular monthly journal club to help clinicians keep up to date. This strategy would help to ensure that employees read and appraise at least 10 to 12 research articles per year, articles that should be informing their practice. Furthermore, the 'new' type of journal clubs, such as that described by Dingle and Hooper (2000) involve all participants reading and all participants appraising the same research article. Currently, many journal clubs involve only one person appraising a study without using an appraisal checklist, where personal biases and lack of skill will heavily influence the interpretation. This model of journal club needs to be replaced by one where all employees participate and share their interpretation, thereby improving their knowledge of research methodology and statistics, but also informing their practice.

## **Critically Appraised Topics (CATs): An achievable and Practical Study Outcome**

Those participants who successfully completed a CAT were the *Competent Non-Experts*, the champions of EBP and the opinion leaders. They were motivated and driven by project and self-imposed deadlines, and by the assignment which required them to practice their search and appraisal skills. Two participants have since revised and updated their CAT. Interstate and overseas occupational therapists use the completed CATs as a model, and ask to have their completed work uploaded to the website. Thus, the CATs were effective for developing participants' skills and knowledge, for disseminating participants' work, and for prompting therapists outside the study to engage with EBP.

However, the small number of CATs completed over the 8 months (n=15) by a total of 114 therapists suggests that some professionals are not willing or able to engage in search and appraisal to the degree required for production of a CAT. For these professionals, pre-appraised research evidence such as that provided by OTseeker ([www.otseeker.com](http://www.otseeker.com)) is the next best alternative. Pre-appraised evidence will help these professionals to access best-evidence more easily and efficiently.



## **Teaching others about EBP: The role and importance of EBP champions**

*Teaching EBP to others* helped some participants to advance their skills and knowledge. Teaching others can facilitate self-learning and is recognised as an effective way of improving performance. Teaching students was recently proposed as a strategy for promoting use of research evidence (Craik & Rappolt, 2003). These researchers found that when experienced occupational therapists taught students in clinical practice or on campus, this teaching role consolidated their skills and knowledge:

*Participants reported that students acted as catalysts for their own learning by modelling skills for research retrieval and critical analysis, presenting opportunities for the discussion of the research, and its application to practice (p. 271).*

Yet in the current study, few participants, other than the three *Competent Non-Experts* engaged in teaching others. Perhaps there needs to be an expectation or commitment from health professionals who are learning about EBP that they will teach others about EBP, as well as seeking help from others when they return to work.

There is a wide range of internet resources and educational websites available for those engaged in teaching. These sites include: OTseeker (Occupational Therapy Systematic Evaluation of Evidence ([www.otseeker.com](http://www.otseeker.com)); the Critical Appraisal Skills Program (CASP) ([www.phru.org.uk/~casp/casp.htm](http://www.phru.org.uk/~casp/casp.htm)); the Centre for Evidence-Based Practice (CEBP) (Australia) ([www.sph.uq.edu.au/cgp/red/practice/cebp.html](http://www.sph.uq.edu.au/cgp/red/practice/cebp.html)); the Centre for Evidence-Based Medicine (UK) ([www.cebm.net/index.asp](http://www.cebm.net/index.asp)); and the Centre for Evidence-Based Medicine (Canada) ([www.cebm.utoronto.ca](http://www.cebm.utoronto.ca)). Many of these websites contain presentations and tutorials that can be downloaded by practitioners for teaching purposes. An example of a presentation on EBP is available at the Oxford-Centre for Evidence Based Medicine ([www.cebm.net/downloads.asp](http://www.cebm.net/downloads.asp)).

## **Lack of Internet Access at Work may (or may not) be a Barrier to EBP**

At the conclusion of the study, almost a quarter (23%) of participants did not have access to the internet at work. This statistic changed little over time (28% before and 26% after the workshop). The reasons for continued lack of internet access at work are unknown, but are likely to be associated with cost. However, it would be incorrect to assume that a quarter of participants could not access electronic databases and were, as a consequence, unable to engage in EBP. First, consideration must be given to the question that participants were asked in the survey.

Participants were asked if they had access to *the internet and World Wide Web* at work. The study did not discriminate between access to the *internet and World Wide Web* versus access to *electronic databases*. There is a difference. For example, employees of NSW Health have access to subscription databases such as Medline and Cinahl at work (as well as OTseeker and PEDro), but not to the internet. Therefore, caution is needed when interpreting the 23% of participants who could not access the internet at work.

Furthermore, approximately one quarter of participants engaged in search and appraisal activities outside of work hours. Some activities were conducted at home, and some in the workplace. Therefore, it would be incorrect to assume that lack of internet access at

work is a barrier to EBP, because some employees were only able to find time for searching outside of their work hours.

Individual access to the internet may not be the most efficient way of obtaining best evidence. Using the services of health librarians to assist with searching may be a better use of staff time and resources. Some study participants were already using health librarians in this way. Occupational therapists and their managers need to identify the most efficient way of accessing research evidence and the resources needed to facilitate this process.

## **Prioritising EBP at an Organisational Level**

Approximately one quarter of participants engaged in search and appraisal activities outside of work hours. If health professionals are expected to routinely use evidence in practice, it seems reasonable to expect that time will be allocated during work time for searching and appraisal activities. However, some participants and organisations did not value engagement in EBP to the same degree as clinical work. A necessary condition for moving ahead with EBP was the expectation, both personally and within the organisation, that EBP would be talked about, taught, practiced and mastered.

The way in which time is allocated for EBP activities in work hours will vary across organisations. What is critical is that health professionals and managers recognise, plan for, and prioritise these activities as an essential part of their practice. This approach to research utilisation is not new, and has been discussed at length by others (see Brown & Rodger, 1999 for a review). Searching, reading and critical appraisal cannot be considered activities to 'fit in' when there is a spare hour here or there. The interview data clearly showed that these activities had to be given a high value and prioritised in the same way as meetings, case conferences and client contact. Therefore, EBP needs to be mentioned in business plans, annual reports, orientation program documentation and performance appraisals; EBP needs to be visible. This could be considered an important criteria for accreditation of healthcare facilities and organisations that claim to be 'evidence-based'.

## **A Revised Model of Change for EBP**

Understanding stages of change can be helpful to both educators and learners when developing programs to change behaviour (Bradt & Moyer, 2003; McCluskey & Cusick, 2002; National Health Service Centre for Reviews and Dissemination, 1999; Rejeski, Brawley, MacAuley & Rapp, 2000. Education may be more effective if matched to the stage of change a person is at (Levesque et al., 2001). However, a recent systematic review reported that stage-based interventions were no more effective at changing health behaviours, such as smoking and diet, than non-stage-based interventions (Riemsma, Pattenden, Bridle et al., 2002).

The staged model of change described by Prochaska and DiClemente<sup>16</sup> has traditionally been used in EBP literature to describe the progression of learners. For example, people in the *preparation* stage of change are reported to benefit from education such as audit and feedback, peer review and reminder systems (NHMRC, 2000). This model was used as the theoretical model for the current study. Prochaska and DiClemente's model has typically been used to describe how individuals adopt behaviours and habits that are difficult to change, such as engaging in physical activity, stopping smoking, reducing overeating and alcohol consumption (Prochaska, Velicer, Rossi et al., 1994). Similarly, the uptake of EBP requires a major change in behaviour, attitudes and work habits.

Participants in this study were at different stages of change. *Novices* appeared to be fluctuating between the *contemplation* and *preparation* stages. They had accepted the need for change through volunteering to attend the workshop, but were not yet making a concerted effort to incorporate this new way of working into their practice. Individuals at the stage of *contemplation* typically weigh up the pros and cons of an action (Prochaska et al., 1992). Study participants at this stage compared the benefits of an EBP approach with the amount of effort, time and difficulty involved in making the change. Participants at the *preparation* stage of change were preparing for change and had made some small changes to their behaviour, such as starting to question practice. However, they had not yet made a full commitment to incorporating EBP into their clinical reasoning. *Competent Non-Experts* were at the *action* stage. Changes to practice were planned, but using evidence in practice was not yet routine. No participants appeared to be in the *maintenance* stage of change. Most moved between stages, depending upon conditions and the success of strategies used to help overcome barriers. For example, several participants moved between the *contemplation* and *preparation* stages and others moved between the *preparation* and *action* stages. The literature on change suggests that this movement back and forth between stages is common (Prochaska et al., 1992).

Prochaska and DiClemente's model of change helped provide insight into individual participants' level of readiness for change. A strength of this model is the consideration that a learner may not be ready to change, or even be thinking about change. Consequently, the success of an intervention program, such as that reported here should not be judged solely on immediate or short-term change. The value may lie more in the ability of interventions to prepare a learner for change.

The current study identified limitations of the Prochaska and DiClemente model of change when applied to EBP. The model does not provide levels that are sensitive enough to reflect the stage each participant is at. For example, the *preparation* stage implies that a person is a beginning practitioner. This description did not accurately reflect all participants at this stage. Some were more advanced than others, but had not yet 'arrived' at the *action* stage. Similarly, participants were at different levels of engagement within the *action* stage. Additional levels or descriptors would enhance use of the model for EBP. The creation of additional levels would enable the model to be

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<sup>16</sup> Prochaska and DiClemente's model (1992, 1998) is a stage model describing the process of change. The first stage, *precontemplation*, is when an individual has no intention to change. *Contemplation* is when a professional begins to think about changing their practice. The *preparation* stage is when a professional decides to learn the skills and knowledge to support the change. *Action* is when an individual begins to implement the new idea. And finally, *maintenance* is when the change is permanent and an individual focuses on maintaining the change

used more effectively. Nonetheless, Prochaska and DiClemente's model is the best available model for describing the process of behavioural change related to EBP.

## **Summary and Conclusion**

The focus of this study was on change - in skills, knowledge, attitudes and behaviour – which are necessary for the uptake of EBP. The aim was to help participants use research evidence more often and more easily when given specialised training and support. Gains were observed and measured in skills and knowledge immediately after the workshop, and again at follow-up. However, the frequency of skill use was low, with less than one quarter of the sample engaging in any reading activities, and even fewer engaging in critical appraisal at any given time in the study. Nonetheless, the study did clearly show that change occurs very slowly, and that practice and application of skills takes months and years. This finding reinforces the importance of longitudinal studies, and extended follow-up periods. The study also confirms the need for qualitative research, which delves into the experiences and attitudes of individuals and helps to explain behaviour. Finally, the study highlights the influence of organisational culture, and how the attitudes and values espoused by others in the workplace – particularly managers – can enhance or inhibit the uptake of EBP.

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## **APPENDIX 1: Steering Committee members**

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Branko <b>Boskoski</b>	Consumer representative, ParaQuad NSW
Sandy <b>Colyer</b>	Occupational therapist, and President of OT Australia - NSW
Lorraine <b>Evison</b>	Liaison Librarian (Health), University of Western Sydney
Jim <b>Grainda</b>	Consumer representative, Brain Injury Association of NSW
Dr Ev <b>Innes</b>	Senior Lecturer, School of Occupation & Leisure Sciences, University of Sydney
Meryl <b>Lovarini</b>	Occupational therapy private practitioner and Project Manager, University of Western Sydney
Suzanne <b>Lulham</b>	Principal Advisor [Rehabilitation], Motor Accidents Authority of NSW
Sue <b>Lukersmith</b>	Director and occupational therapist [private practice], Accent Rehabilitation Service, Penrith, NSW.
Assoc. Prof. Chris <b>Maher</b>	School of Physiotherapy, University of Sydney, NSW
Maria <b>Passarello</b>	Senior occupational therapist, The Children's Hospital at Westmead, Sydney, NSW
Debbie <b>Saunders</b>	Senior occupational therapist, Liverpool Brain Injury Unit, Sydney, NSW



## APPENDIX 2: Information Sheet

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UNIVERSITY OF WESTERN SYDNEY

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Penrith South DC NSW 1797 Australia

School of Exercise & Health Science, Campbelltown Campus

Tel: 46 20 3774

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**Project Title:** *Increasing the use of research evidence by occupational therapists in NSW*

### What is evidence-based practice?

Evidence-based practice (EBP) is a process that involves searching for and appraising research evidence, and then applying this evidence to practice. The aim of EBP is to decrease the use of ineffective interventions and increase the use of proven, effective ones. EBP can help occupational therapists be more accountable to their clients, to purchasers and other health professionals. EBP can also help occupational therapists to improve client outcomes, and the cost effectiveness of services.

### What does the project involve?

This project will train **100 occupational therapists** in NSW how to search for, and appraise research evidence, and apply this evidence to their practice. Training will be provided at a **2-day workshop**, and through **outreach support** during 2002. **Summaries of evidence** will be developed by participants during 2002, including summaries relevant to traumatic brain injury, spinal cord injury and chronic pain/low back injury rehabilitation. These summaries will be made available to other occupational therapists in 2003 via a free website, which will be developed as part of the project. Finally, the results of this project will be presented by participants at an **occupational therapy conference on EBP** in 2003.

### What would I need to do?

Participants will be asked to:

- Sign a consent form;
- Attend a two-day workshop in February 2002 (either 1/2 Feb **OR** 15/16 Feb **OR** 22/23 Feb). Participants will be able to choose one of these three repeat workshops, to be held at the University of Western Sydney (Bankstown campus). Participants will be asked to contribute \$40 towards the cost of the workshop (which will be subsidised by UWS and a grant from the Motor Accidents Authority);
- Complete three surveys: pre workshop (Dec 2001), post workshop (Feb 2002), at the conclusion of the project (November 2002);
- Maintain a record of EBP activities (similar to AccOT forms);
- Network and liaise with other workshop participants during 2002 to produce at least one summary of research evidence on a topic of their choice. This networking may take place in person or via telephone, fax or email.

Outreach support will be provided for EBP activities following the workshops. There will be no cost for this support, which will include phone and email contact, and at least one workplace visit. Ten participants will be asked to take part in an interview at the conclusion of the project. Participants will be encouraged to attend and present their summaries of evidence at a conference in 2003.

### Are there any costs to participants?

Yes. Participants will be asked to contribute \$40 towards the cost of the two-day workshop (mostly to cover catering costs), and pay for any associated travel and accommodation costs. The cost to participants has been kept to a minimum, and compares favourably to the fee of \$396 for a similar two-day workshop

conducted by OT Australia NSW in Dec. 2000. The workshop is being subsidised by UWS and a grant from the Motor Accidents Authority of NSW.

### **What are the benefits of participating?**

By participating in this project you will:

- Gain skills in EBP that will be increasingly expected of all occupational therapists;
- Be able to readily justify your interventions to managers, purchasers and clients;
- Contribute to your own professional development;
- Gain accreditation points across a number of categories towards the AccOT Accredited Occupational Therapist Program.

### **Are there any risks?**

There are no known risks associated with this research, and no disadvantages or penalty for not participating or withdrawing prematurely from the project. You can withdraw or drop out at any time during the project without any consequences, and you do not need to give a reason. Your responses and comments, and level of participation will remain confidential to the researchers. Your work supervisor will not be able to access information contained in your surveys.

Assistance to facilitate and manage change will be provided to all participants throughout the project. However, should the process of change result in anxiety or concern to a participant, or conflict within the workplace, that person can be referred to their immediate supervisor, or to a workplace/ local counselling service.

### **Who is conducting the study?**

This project is being conducted by Annie McCluskey of the University of Western Sydney, and is funded by the Motor Accident Authority of NSW. Questions about the project can be directed at any time to the following people:

**Note:** This study has been approved by the University of Western Sydney Human Research Ethics Committee. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Research Ethics Officers (tel: 02 4570 1136). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

*Meryl Lovarini*  
**Research Project Manager**  
Telephone: 02 4620 3774 or 02 9631 8811  
Email: [Lovarini@bigpond.com.au](mailto:Lovarini@bigpond.com.au)

*Annie McCluskey*  
**Chief investigator**  
Telephone: 02 4620 3774  
Email: [a.mccluskey@uws.edu.au](mailto:a.mccluskey@uws.edu.au)

## **APPENDIX 3: Critically Appraised Topic (CAT)**

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Does training in workplace adjustment and posture prevent occupational overuse syndrome in workplace based computer users?

*Prepared by:* Meryl Lovarini  
Research Project Manager UWS

*Date:* November 2002

*Review Date:* November 2004

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### ***Clinical Question***

Does training in workplace adjustment and posture prevent Occupational Overuse Syndrome in workplace based computer users?

### ***Clinical Scenario***

Training in workstation adjustment and posture is often recommended to prevent occupational overuse/ repetitive strain injuries for computer users in the workplace. What is the effectiveness of this intervention in preventing these types of conditions?

### ***Summary of Key Findings***

- 14 studies were located that met the inclusion/exclusion criteria.
- 3 RCT studies were located and appraised.
- One RCT found improvements in postural stressors, appropriate workstation components and reported symptoms primarily in participants under the age of 40 years who underwent an ergonomic training program. However despite a rigorous study design, no between groups statistical analysis was conducted.
- One RCT found less short-term musculoskeletal discomfort as a result of two different types of ergonomic interventions but the differences were small between the intervention and control groups. No differences were found for reported long term strain levels or prevalence of pain.
- One RCT found positive changes in participant knowledge and work habits as a result of two different types of ergonomic training program. However the differences between the experimental groups and the control group were small and there were methodological problems with the study design.
- None of the studies measured changes in injury or incidence rates of occupational overuse syndrome (or related conditions) or effects on compensation claim numbers or costs.

### ***Clinical Bottom Line***

Providing training in workplace adjustment and posture may lead to small reductions in musculoskeletal discomfort and small increases in knowledge and appropriate workstation adjustments. None of the studies reviewed measured changes in injury or compensation claim rates related to occupational overuse syndrome. Currently there is no published evidence that training can prevent occupational overuse or related disorders amongst workplace based computer users.

## **Limitation of Summary of Evidence**

This summary of evidence has been individually prepared and has not undergone a process of peer review.

## **Methodology**

### ***Search Strategy***

Using the levels of evidence as defined by the NHMRC (2000), the search strategy aimed to locate the following study designs:

Level I	Systematic Reviews and Meta-analyses;
Level II	Randomised Controlled Trials;
Level III	Controlled trials, cohort or case-control analytic studies;
Level IV	Case series: Post – test only, Pre - test/Post – test;
Level V	Expert opinion including literature/narrative reviews, consensus statements, descriptive studies and individual case studies.

A search was also conducted for clinical practice guidelines based on these levels of evidence.

### ***Search Terms***

Patient/Client: Occupational overuse syndrome, cumulative trauma disorders, repetitive strain injury, repetitive strain injur\*, computer us\*, video display unit, video display terminal

Intervention: Training, education, ergonomic training, workplace adjustment, workplace ergonomics, workplace modification

Comparison: Nil

Outcome: Prevention

### ***Sites/Resources Searched***

- National Health and Medical Research Council
- New Zealand Guidelines Group
- National Guidelines Clearinghouse
- UK Guidelines: National Electronic Library for Health, Clinical Guidelines Database
- Scottish Intercollegiate Guidelines Network (SIGN)
- Workcover NSW
- National Occupational Health and Safety Commission
- Cochrane Library
- Database of Abstracts of Reviews of Effectiveness (DARE)
- PEDro – The Physiotherapy Evidence Database
- Effective Health Care Bulletins
- Centre for Clinical Effectiveness (Monash University) – Evidence Reports
- HTA Health Technology Assessments
- Joanna Briggs Institute
- PubMed
- [Journals@Ovid](#) Full text
- Medline – Pre Medline
- CINAHL
- AMED
- Embase
- OSH-ROM

## ***Inclusion/Exclusion Criteria***

### *Inclusion Criteria*

- Studies including prevention related outcome. Eg. Incidence of OOS, injury rates, workers compensation claims; symptoms of OOS or related conditions, reduction in risk factors for OOS.
- Studies investigating training as an intervention to prevent occupational overuse injuries or related conditions amongst computer users
- Studies published in English

### *Exclusion Criteria*

- Studies investigating treatments (as opposed to preventive training/educational interventions) for occupational overuse injuries or related conditions

## **Results**

Thirteen relevant studies were located and categorised as follows:

*Table 1. Study designs of articles retrieved by search*

<b>Methodology of Studies Retrieved</b>	<b>Number Located</b>	<b>Source of Evidence</b>
Clinical Practice Guidelines (Evidence Based)	0	N/A
Systematic Reviews or Meta – analyses	0	N/A
<b>Randomised Controlled Trials</b>	<b>3</b>	<b>PubMed</b>
Controlled trials, cohort or case-control analytic studies	1	Reference list of RCT article
Case series: Post – test only, Pre - test/Post - test	5	PubMed x1 Embase x1 Cochrane Controlled Trials register x1 Medline x1 CINAHL x1
Expert opinion including literature/narrative reviews, consensus statements, descriptive studies and individual case studies	5	PubMed x2 OSH – ROM x1 AMED x1 NOHSC Website x 1

### ***Specific Results***

The randomised controlled trials were the only studies critically appraised for this summary, as they represent higher levels of evidence. The studies and appraisal findings are summarised in Tables 2 and 3.

Table 2. Description and Appraisal of RCT by Brisson et al (1999)

### **Objective of Study**

To evaluate the effectiveness of an ergonomic training program on the prevalence of postural stressors and appropriate features of workstations and the prevalence of musculoskeletal disorders among VDU users at a large university in Canada.

### **Intervention Investigated**

Experimental group (N = 284) received 2 x 3 hour instructor led training sessions over a two-week period. Training consisted of lecture, demonstration, simulation and participant practice. Program targeted adjustment of workstation and preventative practices at work. Control group (N = 343) received no intervention.

### **Population**

University sector workers using a VDU for more than 5 hours per week.

### **Primary Outcome Measures**

1. Prevalence of workstations with appropriate components, measured via a 10-point checklist.
2. Prevalence of three postural stressors (twisted neck, height of visual target, bent hand-wrist line) associated with musculoskeletal disorders, measured via questions within the 10-point checklist.
3. Prevalence of musculoskeletal disorders, self reported symptoms measured via a self-administered questionnaire, physical signs and indicators measured via a physical examination.

Measures taken for both groups 2 weeks before and 6 months after the training intervention. Other variables such as the effect of age, number of hours of VDU use per week, seniority in current job and the combination of high demands and low latitude, leisure time physical activity, smoking, and body mass index were evaluated as potential modifiers of the effect of training musculoskeletal disorders.

### **Results**

#### *Prevalence of Appropriate Workstation Components*

There was a modifying effect for age on the prevalence of appropriate workstation components. The prevalence of appropriate workstation components increased significantly for 8 out of the 10 items for the exp. group ( $p < 0.05$ ) and 3 out of the 10 items for the control group ( $p < 0.05$ ) for participants aged less than 40 years of age. The prevalence of appropriate workstation components increased significantly for 5 out of 10 items for the exp. group ( $p < 0.05$ ) and 1 out of 10 items for the control group ( $p < 0.05$ ) for participants aged 40 years or more.

#### *Prevalence of Three Postural Stressors*

There was a modifying effect for age on the prevalence of three postural stressors associated with musculoskeletal disorders. There were significant decreases in the prevalence of all three postural stressors for the exp. group ( $p < 0.01$ ) and a significant decrease in only one postural stressor (bent hand - wrist line) for the control group ( $p < 0.01$ ) for participants aged less than 40 years. There were significant decreases in the prevalence of two postural stressors (twisted neck and bent hand - wrist line) for the exp. group ( $p < 0.01$ ) and for the control group ( $p < 0.05$ ) for participants aged 40 years or more.

#### *Prevalence of Musculoskeletal Disorders*

There was a modifying effect for age on the prevalence of musculoskeletal disorders.

#### Self-administered questionnaire

- *Participants less than 40 years:* There was a 16 %\* decrease in the prevalence of musculoskeletal disorders for the exp. group which was statistically significant ( $p < 0.01$ , within groups analysis). There was an 8%\* decrease for the control group but this was not

statistically significant ( $p=0.07$ , within groups analysis).

- *Participants 40 years or more*: There was a 3%\* increase in the prevalence of musculoskeletal disorders for the exp. group and a 1%\* increase in the control group but neither of these results were statistically significant, ( $p=0.09$  and  $p=0.57$  respectively, within groups analysis).

#### Physical examination

- *Participants less than 40 years*: There was a 16%\* decrease in the prevalence of musculoskeletal disorders for the exp. group which was statistically significant ( $p=0.01$ ). There was an 8%\* decrease for the control group but this was not statistically significant ( $p=0.08$ ).
- *Participants 40 years or more*: There was a 4%\* increase in the prevalence of musculoskeletal disorders for the exp. group and a 2 %\* increase for the control group but these results were not statistically significant, ( $p=0.05$  and  $p =0.41$  respectively).

#### **Authors Conclusions**

Improvements in postural stressors and appropriate workstation components occurred more frequently in the experimental group. Improvements tended to be more frequent in participants under 40 years of age. Improvements in musculoskeletal disorders occurred in the experimental group for participants under the age of 40 only.

#### **Reviewer Appraisal Comments**

##### *Validity (Methodology, rigour, selection, biases)*

- Participants assigned to the experimental or control group on the basis of the units in which they worked.
- Work units randomised to either experimental or control group.
- No details provided of random allocation process.
- Participant eligibility criteria established and groups matched to ensure comparability of results.
- No information provided re blinding of researchers during allocation process.
- Blinding of assessor during the physical examination of participants.
- The physical examination began 3 months after the data collection had started, only 79% of participants underwent the physical examination.
- All participants treated the same way apart from the intervention under investigation.
- No power calculation provided, so cannot comment on adequacy of the sample size.

##### *Results (Favourable or unfavourable, specific outcomes of interest, size of treatment effect, stat. and clinical significance)*

- Statistical analysis provided for within group differences only. No between groups statistical analysis was conducted, so it is unknown if the differences in outcome measures between the two groups are statistically significant. Confidence intervals for the size of the treatment effect for each outcome measure cannot be estimated as no standard deviation data are provided.
- The definition of 'musculoskeletal disorders' used in this study is based on authors' own definition.
- The authors conclusion that there have been 'improvements' in musculoskeletal disorders in the experimental group for participants less than 40 years of age simply means a 'decrease' in self reported symptoms and physical signs as measured by an occupational therapist. The conclusion is not based on injury rates or claim numbers.
- No information on program costs provided.

Table 3. Description and Appraisal of RCT by Ketola et al (2002)

### **Objective of Study**

To evaluate the effect of an intensive ergonomic approach and education on workstation changes and musculoskeletal disorders among workers who use video display units.

### **Population**

Office based professionals with self-reported musculoskeletal symptoms, mouse use for more than 5% of the work time with the VDU, aged <61 years.

### **Intervention Investigated**

- *Intensive Group (N = 39)*: Worksite visit (1.5 – 2 hours) from a physiotherapist who introduced an ergonomic checklist, which emphasised the layout/environmental conditions, workstation adjustments and work breaks. Subjects then evaluated their workstation according to the checklist, findings discussed with the physiotherapist and adjustments and alterations made. Advice re work postures and pause breaks provided by the physiotherapist. All subjects provided with a one-page leaflet on musculoskeletal health in association with VDU work.
- *Ergonomic Education (N = 35)*: Subjects attended a one-hour training session in ergonomics in groups of 2 – 6 people. Subjects instructed in principles of ergonomics in VDU work and given same checklist as the intensive group. Subjects were encouraged to evaluate their own workstation, implement changes and ask for equipment if necessary. Subjects were instructed to add short pauses to work and adopt relaxed work postures. All subjects provided with a one-page leaflet on musculoskeletal health in association with VDU work.
- *Reference Group (N = 35)*: Provided with a one-page leaflet only on musculoskeletal health in association with VDU work.

### **Primary Outcome Measures**

1. *Changes in Workstation Ergonomics*: Most common changes in the workstations observed or measured by two blinded experts. Measurements taken at baseline, 2 months and 10 months post intervention.
2. *Changes in Ratings of Workstation Ergonomics*: Measured as an overall ergonomic rating on a scale from 4 (poor) to 10 (excellent). Measurements taken at baseline, 2 months and 10 months post intervention.
3. *Musculoskeletal Discomfort*: Subjects were asked to keep a diary on comfort three times a day for two weeks before the intervention and for 2 weeks at 2 months and 10 months post intervention. Subjects were asked to rate discomfort in various head, neck and upper limb locations on a scale of 1 (feels good) to 5 (feels very uncomfortable).
4. *Musculoskeletal Strain and Pain*: Subjects were measured at baseline and at 10 month follow up on a questionnaire, which included questions on musculoskeletal strain and pain experienced during the preceding 30 days. Strain was assessed on a 5-point scale from 1 (no strain at all) to 5 (very much strain). Presence of pain was assessed as the number of days with or without pain.

### **Results**

#### ***Changes in workstation ergonomics***

Descriptive statistics demonstrate that changes in screen height, keyboard desk height and the acquisition of wrist and forearm supports were more frequent in the intensive ergonomics group. Adjustments for chair and mouse location were common across all three groups. No tests for statistical significance were conducted on these results.

#### ***Changes in ratings of workstation ergonomics***

##### ***Intensive ergonomics group compared to reference group.***

Ratings of workstation ergonomics were similar at baseline for both groups. At 2-month post intervention the intensive ergonomics group had a statistically significant higher rating in workstation ergonomics ( $p = 0.001$ ). The size of the difference in ratings between the two groups was 0.9 of a point on a 7-point ergonomic rating scale. At 10 months post intervention the



intensive ergonomics group had a statistically significant higher rating in workstation ergonomics ( $p = 0.002$ ). The size of the difference in ratings between the two groups was 0.7 of a point on a 7-point ergonomic rating scale.

***Education group compared to the reference group.***

Ratings of workstation ergonomics were similar at baseline for both groups. There were no statistically significant differences between the two groups at either 2 months or 10 months post intervention.

***Changes in ratings of musculoskeletal discomfort.***

***Intensive ergonomics group compared to reference group.***

At 2 months post intervention, the intensive ergonomics group had statistically significantly less discomfort in the neck ( $p = 0.014$ ), the area between the neck and right shoulder ( $p = 0.007$ ), right shoulder ( $p = 0.022$ ), left shoulder ( $p = 0.025$ ), left fingers ( $p = 0.017$ ) and the upper back ( $p = 0.001$ ). The size of the differences between the two groups ranged from 0.5 – 0.7 of a point on a five point scale of discomfort. There were no statistically significant differences between the two groups at 10 months post intervention.

***Education group compared to the reference group.***

At 2 months post intervention, the education group had statistically significantly less discomfort in the neck ( $p = 0.013$ ), the area between the neck and right shoulder ( $p = 0.002$ ), the right forearm ( $p = 0.009$ ), and the upper back ( $p = 0.005$ ). The size of the differences between the two groups ranged from 0.5 – 0.6 of a point on a five point scale of discomfort. There were no statistically significant differences between the two groups at 10 months post intervention.

***Musculoskeletal strain and pain***

There were no statistically significant differences between the groups on reported musculoskeletal strain or pain during the preceding 30 days, at 10 months post intervention.

***Authors Conclusions***

Both the intensive ergonomics approach and the education in ergonomics help reduce discomfort in VDU work.

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**Reviewer Appraisal Comments**

Validity (Methodology, rigour, selection, biases)

- Subjects were chosen on the basis of their reported musculoskeletal symptoms, mouse usage and age.
- Subjects were allocated into the three groups using stratified random allocation.
- No details provided on how the randomisation schedule was developed and implemented.
- Groups well balanced at commencement of study with no differences between the groups apparent.
- No information provided re blinding of subjects. Unknown if random allocation conducted under blind conditions. There was blinding of the assessors of workstation ergonomic ratings.
- Low drop out rate and all subjects accounted for at the study conclusion.
- No information provided regarding the use of intention to treat analysis.
- All subjects followed up and data collected in same way.
- No comment from authors re the adequacy of the sample size and if the study has sufficient power to obtain statistically significant results.

*Results (Favourable or unfavourable, specific outcomes of interest, size of treatment effect, stat. and clinical significance)*

- Statistical analysis provided for between groups differences. Between groups analysis conducted for differences between the intensive ergonomic group and the reference group and for the education group and the reference group only.
- No between groups analysis was conducted for differences between the two intervention groups making comparisons between the two interventions difficult. Comparison of means for the intensive ergonomic group and the education group at 2-month and 10 month post intervention reveal minimal differences in results between these two groups.
- P values reported for the majority of results.
- Confidence intervals not provided for any results.
- Although some of the reported results are statistically significant, the size of the treatment effect indicates only small positive changes in workstation ergonomics and musculoskeletal discomfort between the intervention groups and the reference group.
- No information provided on the costs of providing the interventions.

*Table 4. Description and Appraisal of RCT by Rizzo et al (1997)*

***Objective of Study***

To examine the impact and effectiveness of educational interventions/ergonomic training on immediate and long-term knowledge and computer related work practices among computer users within a private corporation. Pre intervention sample size estimated to be 150 with approximately 50 participants allocated to each of the three groups.

***Intervention Investigated***

- Group A: 60 minute ergonomics educational seminar led by a trained instructor comprising a presentation, watching of two videos, provision of written information and group discussion. Content focussed on risk factors for cumulative trauma disorders, recommended workstation adjustments and recommended breaks and exercise.
- Group B: 45-minute self-directed seminar involving watching of two videos and the provision of written information.
- Group C: Control group who received no intervention.

***Population***

Office based workers who work at a computer for more than 4 hours per 12-hour period.

***Primary Outcome Measures***

1. Changes in immediate and long term knowledge (at 15 month follow up) of ergonomic principles, measured via a 22 question multiple choice knowledge test.
2. Changes in immediate and long term (at 15 month follow up) personal computer use habits, measured via a 27-point questionnaire (no detail provided on how this was administered).

Baseline measures taken for all three groups prior to the intervention. Immediate measures (taken immediately post intervention) for changes in knowledge taken for Groups A and B only. Long term measures taken for all three groups 15 months post intervention.

## **Results**

### *Changes in knowledge*

Groups A and B both demonstrated statistically significant improvements in immediate and long-term knowledge ( $p < 0.001$ , within group analysis). The control group did not show any significant change in long-term knowledge (no p value given). There were statistically significant differences in the degree of long term knowledge change between Group A and the control group ( $p < 0.05$ ). The size of this difference is equal to 4.7 correct answers on the 22-point test.

There were statistically significant differences in the degree of long-term knowledge change between Group B and the control group ( $p < 0.05$ ). The size of this difference is equal to 2.6 correct answers on the 22 point test. There were no significant differences in the degree of long term knowledge change between Groups A and B (no p value given).

### *Changes in computer use and work habits*

Groups A and B demonstrated statistically significant changes in reported computer use and work habits at 15 months follow up ( $p < 0.001$ , within groups analysis). The control group did not show any improvement or change (no p value given). Statistically significant differences were found between Group A and the control group ( $p < 0.05$ ). The size of this difference is equal to 2.8 items on a 27-item questionnaire. There were statistically significant differences between Group B and the control group ( $p < 0.05$ ). The size of this difference is equal to 2.0 items on the 27 item questionnaire. There were no statistically significant differences between Groups A and B (no p value given)

## **Authors Conclusions**

Ergonomic training programs increased user knowledge and the number of self reported workstation adjustments and work habits. Ergonomic training programs can be effective as a preventative health promotion measure to increase employee knowledge of cumulative trauma disorders risk factors and solutions, resulting in changed intentions, altered risk behaviour and self reported benefits.

## **Appraisal Comments**

### *Validity (Methodology, rigour, selection, biases)*

- Participants assigned to the experimental or control groups according to the building that they worked in.
- Three buildings allocated randomly to either Group A, Group B or the Control Group but unclear how the randomisation occurred.
- Participant eligibility criteria established and groups were comparable both for the number of employees and the type of work performed. No other demographic or comparison data provided.
- No information provided re blinding of subjects or researchers.
- 50% drop out rate due to company lay offs and transfers. Analysis of results based on following sample sizes:
  - Group A:  $n = 28$
  - Group B:  $n = 22$
  - Group C:  $n = 17$
- All participants treated same way except for the interventions under investigation.
- No power calculations provided so cannot comment on adequacy of sample size, authors state that this is a pilot project only.

*Results (Favourable or unfavourable, specific outcomes of interest, size of treatment effect, stat. and clinical significance)*

- No confidence intervals provided for estimation of the size of the treatment effect between Group A and the control group and Group B and the control group. These have been estimated as follows:
- Changes in participant knowledge at 15 month follow up:  
Group A and Control: Size of treatment effect is 4.7 correct answers on the knowledge test of 22 items (95%CI = 2.54 – 6.86)\*  
  
Group B and Control: Size of treatment effect is 2.6 correct answers on the knowledge test of 22 items (95%CI = 0.32 – 4.88)\*
- Changes in participant computer use and work habits at 15 month follow up:  
Group A and Control: Size of treatment effect is 2.8 items on a 27 point questionnaire, (95% CI = 1.66 – 3.94)\*  
  
Group B and Control: Size of treatment effect is 2.0 items on a 27 point questionnaire, (95% CI = 0.98 – 3.02)\*
- Although these results are statistically significant, the size of the treatment effect and associated confidence intervals indicate only small positive improvements in knowledge and work habits between the experimental groups and the control group.
- No information on program costs provided.

\* Reviewer calculations

## **Reference List**

National Health and Medical Research Council. (2000) How to use the evidence: assessment and application of scientific evidence. Handbook series on preparing clinical practice guidelines. Canberra: Commonwealth of Australia.

## **Articles appraised for this CAT**

### ***Level II Evidence***

- Brisson, C., Montreuil, S., & Punnett, L. (1999). Effects of an ergonomic training program on workers with video display units. *Scandinavian Journal of Work Environment & Health*, 25(3), 255 – 263.
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Additional CATs can be downloaded free of charge from [www.otcats.com](http://www.otcats.com)

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## APPENDIX 4 (a) Comparison of Study Completers and Non Completers

<i>Demographics and Other Characteristics</i>	<i>Non-completers n = 26 (%)</i>	<i>Completers n = 88 (%)</i>
<b>Level of Initial OT Qualification</b>		
Diploma	3 (12)	12 (14)
Degree	23 (88)	76 (86)
<b>Time since graduation</b>		
< 5 years	4 (15)	25 (28)
≥ 5 but < 10 years	7 (27)	12 (14)
≥ 10 years	15 (58)	51 (58)
<b>Postgraduate Qualifications</b>		
No	17 (65)	55 (63)
Yes	9 (35)	33 (37)
<b>Enrolled in Postgraduate Study</b>		
No	21 (81)	79 (90)
Yes	5 (19)	9 (10)
<b>Employment Status</b>		
Full-Time	18 (69%)	64 (73%)
Part-Time	8 (31%)	23 (26%)
Not currently employed	0	1 (1%)
<b>Geographic Location (n=87)</b>		
Sydney metropolitan	16 (62)	56 (65)
Regional or rural	10 (38)	31 (35)
<b>Primary Work Role (n=87)</b>		
Clinician	10 (39)	60 (69)
Manager	6 (23)	8 (9)
Consultant	7 (27)	15 (17)
Other	3 (11)	4 (5)
<b>Primary Work Setting (n=87)</b>		
Public	11 (42)	43 (49)
Private	15 (58)	44 (51)
<b>Access to the Internet</b>		
No	0	7 (8%)
Yes	26 (100%)	81 (92%)
<b>Access to the Internet at Work (n=84)</b>		
No	4 (15%)	27 (32%)
Yes	22 (85%)	57 (68%)
<b>Access to the Internet at Home (n=84)</b>		
No	8 (31%)	22 (26%)
Yes	18 (69%)	62 (74%)
<b>Use of Internet in past 4 Weeks for Work (n=87)</b>		
No	7 (27%)	30 (35%)
Yes	19 (73%)	57 (65%)

## **APPENDIX 4 (b)**

### **Comparison of Study Completers and Non Completers (Perceived Barriers)**

<i>Perceived Barrier to EBP</i>	<i>Non-Completers n= 26 (%)</i>	<i>Completers n=88(%)</i>
Lack of time	20 (77)	66 (75)
Large workload/caseload	18 (69)	58 (66)
Lack of supervisor interest & support	0 (0)	4 (5)
Lack of management interest & support	0 (0)	5 (6)
My own lack of interest/enthusiasm	1 (4)	6 (7)
Professional isolation	6 (23)	18 (21)
Entrenched workplace behaviours & habits	4 (15)	11 (13)
Difficulty accessing a computer	2 (8)	17 (19)
Difficulty accessing journals	11 (42)	40 (46)
Limited searching skills	13 (50)	56 (64)
Limited critical appraisal skills	11 (42)	57 (65)
Use of research evidence is not a priority where I work	3 (12)	11 (13)
Lack of evidence to support what we do in OT	6 (23)	25 (29)
Limited support for continuing education where I work	2 (8)	7 (8)
The large volume of published research	9 (35)	24 (27)
Limited resources and funding to support change to EBP	4 (15)	19 (22)
Benefits and advantages of adopting EBP are not clear	2 (8)	9 (10)

## APPENDIX 4 (c)

### Comparison of Study Completers and Non Completers (Attitudes to EBP)

<i>Attitude</i>	<i>Non-Completers n = 26 (%)</i>	<i>Completers n = 88 (%)</i>
<b>Q1 The adoption of evidence-based practice, however worthwhile as an ideal, places too many demands on me and my workload</b>		
Agree	8 (30)	12 (14)
Disagree	9 (35)	48 (55)
Unsure	9 (35)	28 (31)
<b>Q2 Evidence-based practice improves client care</b>		
Agree	22 (85)	75 (85)
Disagree	0 (0)	0 (0)
Unsure	4 (15)	13 (15)
<b>Q3 Evidence-based practice is of limited value in occupational therapy because there is not enough research evidence</b>		
Agree	3 (12)	11 (13)
Disagree	7 (27)	42 (48)
Unsure	16 (61)	35 (40)
<b>Q4 Evidence-based practice is client-centred</b>		
Agree	6 (23)	42 (48)
Disagree	5 (19)	7 (8)
Unsure	15 (58)	39 (44)
<b>Q5 Evidence-based practice is important to occupational therapy</b>		
Agree	26 (100)	87 (99)
Disagree	0 (0)	0 (0)
Unsure	0 (0)	1 (1)
<b>Q6 The practice of evidence-based practice allows occupational therapists to follow reliable guidelines without having to exercise their clinical judgement</b>		
Agree	2 (8)	3 (3)
Disagree	18 (69)	77 (88)
Unsure	6 (23)	8 (9)
<b>Q7 It is important to write a clinical question before conducting a search for evidence, because this approach improves efficiency and the likelihood of finding relevant material</b>		
Agree	20 (77)	64 (73)
Disagree	0 (0)	1 (1)
Unsure	6 (23)	23 (26)



## APPENDIX 4 (d)

### Comparison of Study Completers and Non Completers (Skills and Knowledge)

<i>Skills and Knowledge</i>	<i>Non-Completers n = 26 (%)</i>	<i>Completers n = 88 (%)</i>
<b>I feel confident that I can generate a clinical question when searching databases</b>		
Agree	9 (35)	29 (33)
Disagree	7 (27)	24 (27)
Unsure	10 (38)	35 (40)
<b>I am aware of and have used a range of electronic databases (e.g. PEDro, Cochrane, PubMed)</b>		
Agree	9 (35)	42 (48)
Disagree	14 (54)	36 (41)
Unsure	3 (11)	10 (11)
<b>I am able to undertake a computer search on my own using electronic databases</b>		
Agree	7 (27)	42 (48)
Disagree	8 (31)	23 (26)
Unsure	11 (42)	23 (26)
<b>I feel confident about my general computer skills such as using the internet</b>		
Agree	20 (77)	66 (75)
Disagree	4 (15)	12 (14)
Unsure	2 (8)	10 (11)
<b>I feel confident that I can critically appraise research evidence</b>		
Agree	6 (23)	14 (16)
Disagree	7 (27)	34 (39)
Unsure	13 (50)	40 (45)
<b>I feel confident that I can review and evaluate my practice</b>		
Agree	12 (46)	37 (42)
Disagree	2 (8)	9 (10)
Unsure	12 (46)	42 (48)
<b>I feel confident that I can change my practice in response to new evidence</b>		
Agree	21 (81)	66 (75)
Disagree	0 (0)	1 (1)
Unsure	5 (19)	21 (24)

## APPENDIX 4 (d)

### Comparison of Study Completers and Non Completers (Skills and Knowledge - continued)

<i>Skills and Knowledge</i>	<i>Non-Completers n = 26 (%)</i>	<i>Completers n = 88 (%)</i>
<b>A good clinical question consists of an intervention, the target population, the outcome, and a comparison intervention</b>		
Agree	12 (48)	41 (47)
Disagree	1 (4)	2 (2)
Unsure	12 (48)	45 (51)
<b>Databases of primary medical literature such as Medline or PubMed contain only high quality research evidence</b>		
Agree	3 (12)	5 (6)
Disagree	9 (35)	29 (33)
Unsure	14 (54)	54 (61)
<b>An electronic database such as PubMed can only be accessed from hospital/uni libraries</b>		
Agree	0 (0)	2 (2)
Disagree	3 (12)	23 (26)
Unsure	23 (88)	63 (72)
<b>The Cochrane Database is a good place to look for reviews of high quality research based on clearly stated criteria, in many areas of clinical practice</b>		
Agree	9 (35)	37 (42)
Disagree	1 (4)	0 (0)
Unsure	16 (61)	51 (58)
<b>Confidence intervals are a measure of clinical significance, and provide a way of estimating where the 'true' result for any population lies</b>		
Agree	5 (19)	15 (17)
Disagree	0 (0)	2 (2)
Unsure	21 (81)	71 (81)
<b>The P value is a measure of reliability</b>		
Agree	6 (23)	12 (14)
Disagree	2 (8)	8 (9)
Unsure	18 (70)	67 (77)
<b>Single case designs are regarded as a similar level of evidence to randomised controlled trials</b>		
Agree	0 (0)	1 (1)
Disagree	12 (46)	60 (49)
Unsure	14 (54)	26 (30)
<b>There is a recognised hierarchy of evidence (levels of evidence) for qualitative research</b>		
Agree	16 (62)	44 (51)
Disagree	2 (8)	5 (6)
Unsure	8 (30)	38 (44)

## **APPENDIX 4 (d)**

### **Comparison of Study Completers and Non Completers (Skills and Knowledge - continued)**

#### **Knowledge and Skill: Mean Scores Adapted Fresno Test of EBP**

Survey 1 Questions	Non-completers n = 26 n (%)	Completers n = 88 n (%)
Q1	6	6
Q2	13	16
Q3	3	6
Q4	8	10
Q5	7	8
Q6	8	10
Q7	2	3
Total/153	50*	59

\* n=25